

Electronic Supplementary Material (Climate Dynamics)

Spring temperatures in the far-western Nepal Himalaya since A.D. 1640 reconstructed from *Picea smithiana* tree-ring widths

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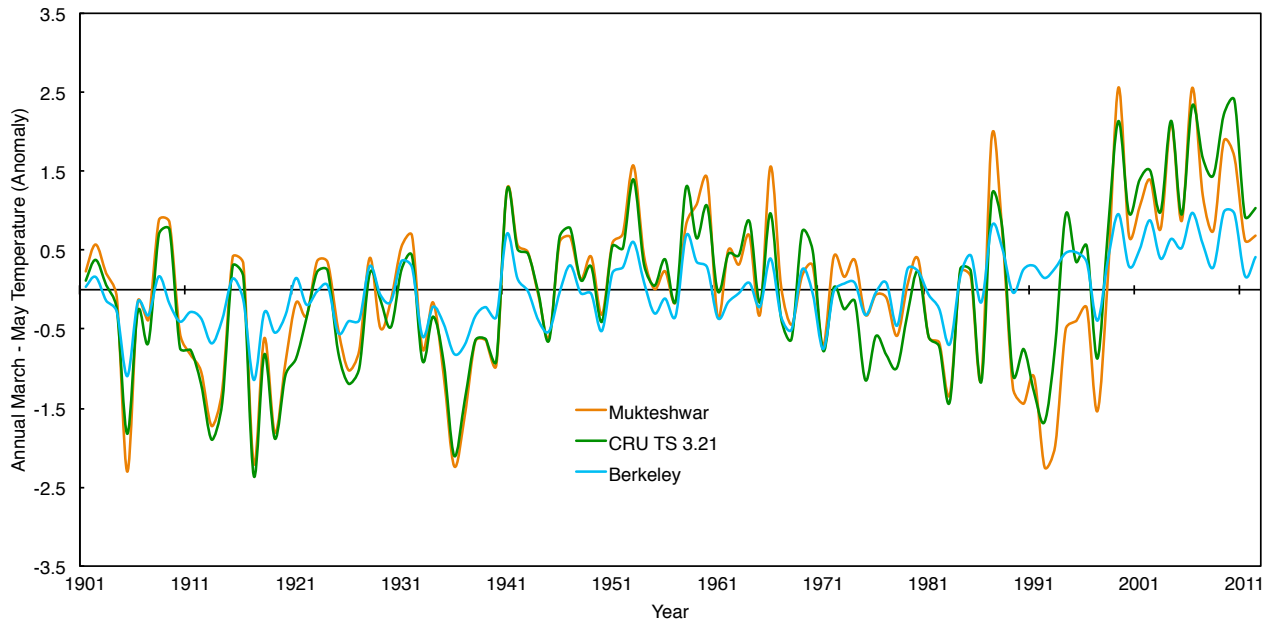
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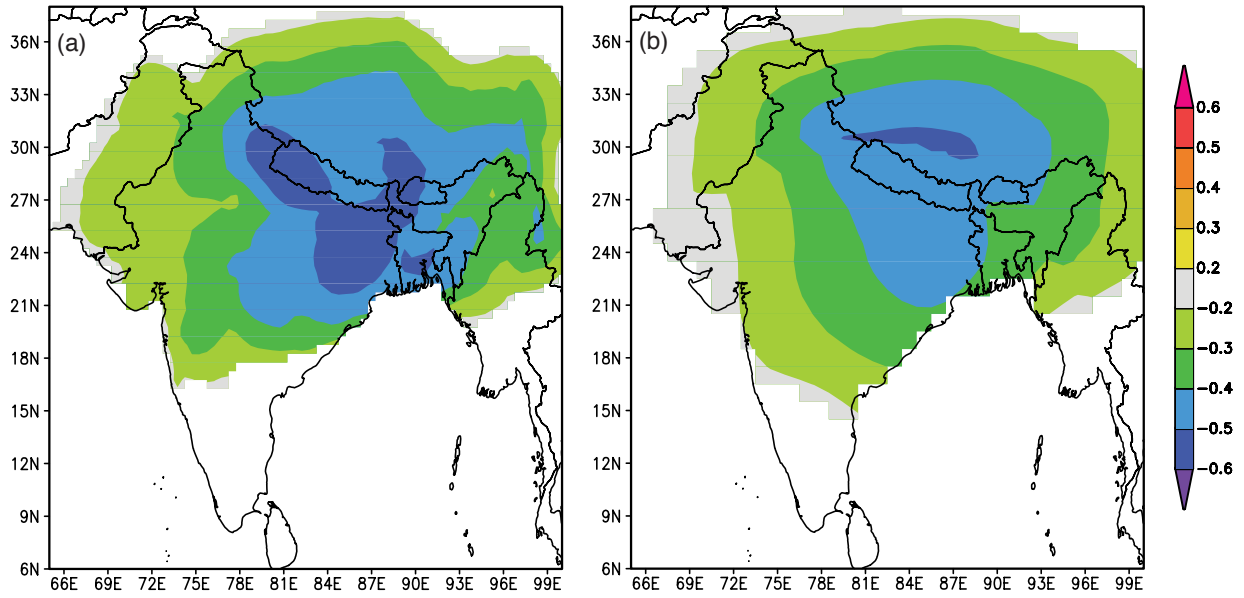
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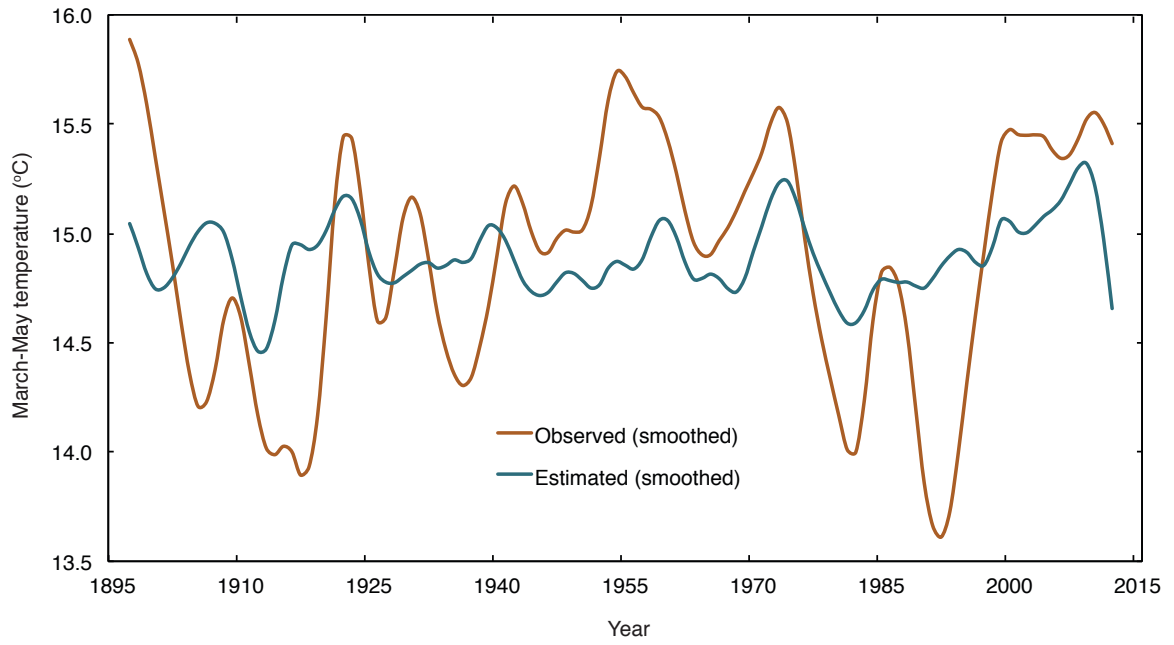
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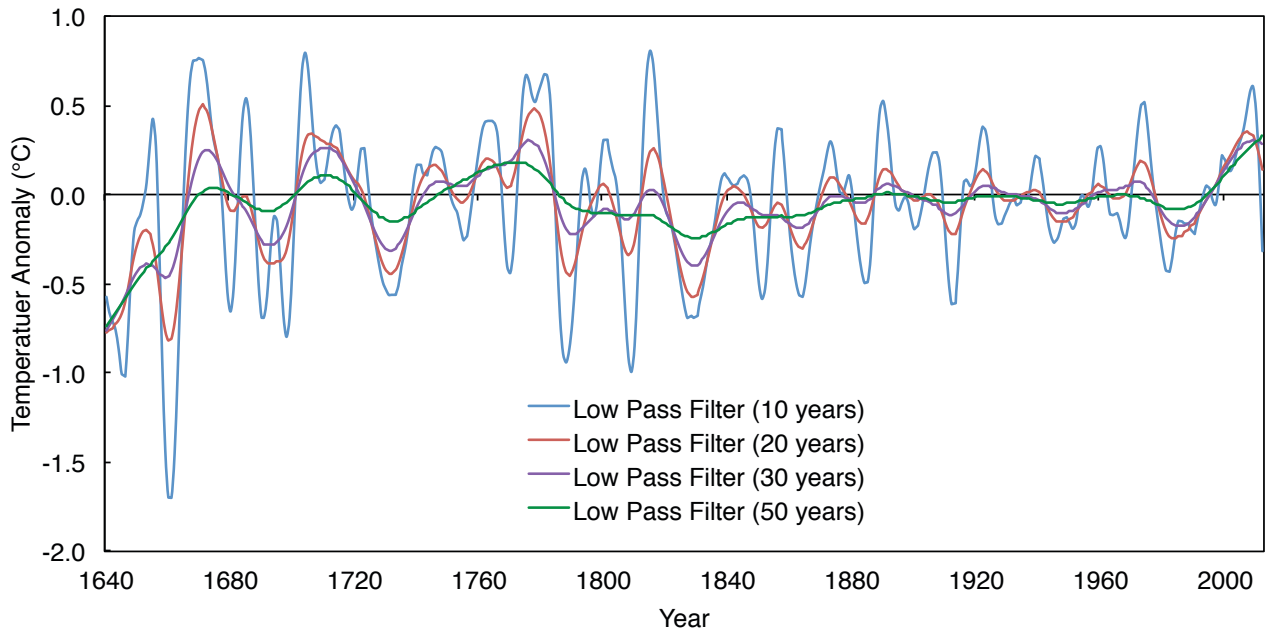
Supplementary Figure 1 Comparison of annual average temperature anomaly of Mukteshwar, CRU TS 3.21 and Gridded Berkeley Earth Surface Temperature for the common time period of AD 1901–2012.



Supplementary Figure 2 Spatial correlations between (a) tree-ring chronology and CRU TS 3.10 gridded average March–May temperature data and (b) between tree-ring chronology and Berkeley average March–May temperature data



Supplementary Figure 3 Low frequency comparison between observe and estimated average March–May temperature data. Both the data was filtered with a smoothing spline with a 50% frequency cut off of 10 years



Supplementary Figure 4 Cold and warm periods recorded in reconstructed March–May temperature data showing in temperature reconstruction filtered with a smoothing spline with a 50% frequency cut off of 10, 20, 30 and 50 years

Supplementary Table 1 Correlation between observed and estimated temperature data and Sea Surface Temperature (SST) index for tropical Pacific Ocean. The correlation was carried out for the time period of AD 1897–2012 (bold-italic figure is significant at $p < 0.05$)

Months	NINO12		NINO3		NINO34		NINO4		MEI	
	Observed	Estimated	Observed	Estimated	Observed	Estimated	Observed	Estimated	Observed	Estimated
Jan	-0.183	-0.206	-0.101	-0.120	-0.085	-0.101	-0.071	-0.097	-0.104	-0.146
Feb	-0.142	-0.196	-0.121	-0.139	-0.112	-0.111	-0.115	-0.103	-0.139	-0.157
Mar	-0.109	-0.164	-0.171	-0.164	-0.176	-0.129	-0.125	-0.090	<i>-0.222</i>	<i>-0.209</i>
Apr	<i>-0.191</i>	<i>-0.216</i>	<i>-0.236</i>	<i>-0.253</i>	<i>-0.202</i>	-0.177	-0.103	-0.113	<i>-0.232</i>	<i>-0.239</i>
May	<i>-0.225</i>	<i>-0.223</i>	<i>-0.302</i>	<i>-0.267</i>	<i>-0.256</i>	<i>-0.230</i>	-0.130	-0.089	<i>-0.337</i>	<i>-0.226</i>
Jun	<i>-0.246</i>	<i>-0.271</i>	<i>-0.288</i>	<i>-0.256</i>	<i>-0.250</i>	-0.173	<i>-0.204</i>	-0.125	<i>-0.350</i>	-0.195
Jul	<i>-0.262</i>	<i>-0.286</i>	<i>-0.282</i>	<i>-0.316</i>	<i>-0.255</i>	<i>-0.253</i>	<i>-0.210</i>	-0.174	<i>-0.347</i>	<i>-0.218</i>
Aug	<i>-0.289</i>	<i>-0.312</i>	<i>-0.252</i>	<i>-0.286</i>	<i>-0.212</i>	<i>-0.232</i>	-0.191	-0.177	<i>-0.358</i>	<i>-0.230</i>
Sep	<i>-0.264</i>	<i>-0.338</i>	<i>-0.239</i>	<i>-0.274</i>	<i>-0.216</i>	<i>-0.230</i>	-0.184	<i>-0.207</i>	<i>-0.379</i>	<i>-0.259</i>
Oct	<i>-0.211</i>	<i>-0.297</i>	<i>-0.232</i>	<i>-0.246</i>	<i>-0.200</i>	<i>-0.202</i>	-0.173	<i>-0.200</i>	<i>-0.377</i>	<i>-0.226</i>
Nov	-0.178	<i>-0.221</i>	-0.187	<i>-0.213</i>	-0.183	<i>-0.208</i>	-0.152	<i>-0.216</i>	<i>-0.345</i>	<i>-0.200</i>
Dec	<i>-0.210</i>	<i>-0.257</i>	<i>-0.221</i>	<i>-0.231</i>	-0.195	<i>-0.206</i>	-0.161	<i>-0.204</i>	<i>-0.371</i>	<i>-0.215</i>
Jan-Apr	-0.181	<i>-0.224</i>	-0.158	-0.172	-0.140	-0.129	-0.107	-0.105	<i>-0.179</i>	-0.193
Feb-May	-0.190	<i>-0.222</i>	<i>-0.223</i>	<i>-0.222</i>	-0.190	-0.165	-0.124	-0.104	<i>-0.243</i>	<i>-0.219</i>
Mar-Jun	<i>-0.215</i>	<i>-0.241</i>	<i>-0.282</i>	<i>-0.266</i>	<i>-0.241</i>	-0.192	-0.146	-0.110	<i>-0.310</i>	<i>-0.238</i>
Apr-Jul	<i>-0.247</i>	<i>-0.267</i>	<i>-0.311</i>	<i>-0.307</i>	<i>-0.266</i>	<i>-0.231</i>	-0.171	-0.134	<i>-0.346</i>	<i>-0.241</i>
May-Aug	<i>-0.268</i>	<i>-0.286</i>	<i>-0.302</i>	<i>-0.304</i>	<i>-0.262</i>	<i>-0.241</i>	-0.198	-0.153	<i>-0.371</i>	<i>-0.232</i>
Jun-Sep	<i>-0.276</i>	<i>-0.312</i>	<i>-0.276</i>	<i>-0.296</i>	<i>-0.244</i>	<i>-0.235</i>	<i>-0.209</i>	-0.184	<i>-0.372</i>	<i>-0.235</i>
Jul-Oct	<i>-0.271</i>	<i>-0.323</i>	<i>-0.258</i>	<i>-0.288</i>	<i>-0.227</i>	<i>-0.236</i>	-0.197	<i>-0.200</i>	<i>-0.374</i>	<i>-0.239</i>
Aug-Nov	<i>-0.249</i>	<i>-0.308</i>	<i>-0.232</i>	<i>-0.259</i>	<i>-0.206</i>	<i>-0.222</i>	-0.178	<i>-0.209</i>	<i>-0.371</i>	<i>-0.233</i>
Sep-Dec	<i>-0.225</i>	<i>-0.290</i>	<i>-0.223</i>	<i>-0.243</i>	<i>-0.201</i>	<i>-0.214</i>	-0.171	<i>-0.213</i>	<i>-0.373</i>	<i>-0.228</i>