SPECIAL PROJECT PROGRESS REPORT

All the following mandatory information needs to be provided. The length should *reflect the complexity and duration* of the project.

Reporting year	2020
Project Title:	EC-Earth in CMIP6 (SPSEECCMIP)
Computer Project Account:	SPNLTUNE
Principal Investigator(s):	Dr. Ralf Döscher
Affiliation:	Rossby Centre, SMHI
Name of ECMWF scientist(s) collaborating to the project (if applicable)	Dr. Glenn Carver
Start date of the project:	2018
Expected end date:	2020

Computer resources allocated/used for the current year and the previous one

(if applicable)

Please answer for all project resources

		Previous year		Current year	
		Allocated	Used	Allocated	Used
High Performance Computing Facility	(units)	60,000,000	60,600,000	50,000,000	96796
Data storage capacity	(Gbytes)	140,000		140,000	

Summary of project objectives (10 lines max)

The objective is to prepare the EC-Earth3-AerChem climate model for CMIP6 experiments. The model includes interactive aerosols and atmospheric chemistry, which affect the radiative properties of the atmosphere. Therefore it differs from the standard EC-Earth3 GCM model, where aerosols and greenhouse gases are prescribed, and it requires a dedicated tuning and spinup. The goal is to tune the IFS component to produce a global temperature for the pre-industrial period on par with observations. Long integration of more than 100 years are needed for robust tests of the various sets of tuning parameters.

Summary of problems encountered (10 lines max)

The AerChem version of EC-Earth is slower and more expensive than its GCM counterpart. This is due to the coupling with TM5, a Chemistry and Transport Model (CTM). Substantial resources were spent on the tuning of this configuration, and the corresponding production simulations for CMIP6 and AerChemMIP. However, while running the CMIP6 historical simulation a coding error was found in the implementation of stratospheric aerosols, which affected specifically this configuration. As a consequence, after fixing the bug, the model needed to be retuned and production runs restarted.

Summary of plans for the continuation of the project (10 lines max)

We will use the remaining resources during 2020 to continue the production simulations, and complete as many of them as possible within the available time and resources.

List of publications/reports from the project with complete references

Three reports are available that describe the activities related to this project:

"Monitoring EC-Earth3-AerChem piControl-spinup"
(https://dev.ec-earth.org/issues/614, PDF attached)

"Additional spinup with EC-Earth3-AerChem 3.3.2.1"
(https://dev.ec-earth.org/issues/785, PDF attached).

"Monitoring EC-Earth3-AerChem CMIP6 DECK runs"
(https://dev.ec-earth.org/issues/812, PDF attached).

Summary of results

If submitted **during the first project year**, please summarise the results achieved during the period from the project start to June of the current year. A few paragraphs might be sufficient. If submitted **during the second project year**, this summary should be more detailed and cover the period from the project start. The length, at most 8 pages, should reflect the complexity of the project. Alternatively, it could be replaced by a short summary plus an existing scientific report on the project attached to this document. If submitted **during the third project year**, please summarise the results achieved during the period from July of the previous year to June of the current year. A few paragraphs might be sufficient.

Here we chose to submit three short reports from the EC-Earth development portal.

The first report (#614) describes the tuning of EC-Earth3-AerChem under pre-industrial control conditions, and is a continuation of the report submitted last year. The second report (#785) describes the re-tuning of the model after the implementation of stratospheric aerosols was fixed. The third (#812) describes the progress of the DECK and AerChemMIP production simulations.

Information request #614

Monitoring EC-Earth3-AerChem spinup and tuning

Added by **Twan van Noije** over 1 year ago. Updated 5 months ago.

Status:	RESOLVED	Start date:	07 Feb 2019
Priority:	High	Due date:	
Assignee:	**Philippe Le Sager**	% Done:	100%
Category:	Multiple components	Estimated time:	
Target version:	[x] CMIP6 Production		

Description

We are about to start the piControl-spinup with EC-Earth3-AerChem, the configuration with interactive aerosols and atmospheric chemistry. This issue can be used to monitor the progress of the simulation, and discuss the desirability of and options for a re-tuning of this configuration.

gregory-aerchem-spin.png (77.7 KB)	Philippe Le Sager, 06 Mar 2019 14:12
t2m-aerchem-spin.png (248 KB)	Philippe Le Sager, 06 Mar 2019 14:12
aerchem-spin-timeseries.pdf (200 KB)	Philippe Le Sager, 06 Mar 2019 14:12
aerchem-spin-timeseries.pdf (316 KB)	Philippe Le Sager, 26 Mar 2019 14:27
t2m-aerchem-spin.png (381 KB)	Philippe Le Sager, 26 Mar 2019 14:27
ece3-control-zonal-t2m-biases.png (110 KB)	Philippe Le Sager, 27 Mar 2019 12:10
aerchem-zonal-t2m-biases.png (133 KB)	Philippe Le Sager, 08 Apr 2019 15:42
t2m-aerchem-tuning.png (233 KB)	Philippe Le Sager, 08 Apr 2019 15:42
t2m-aerchem-tuning-2.png (754 KB)	Philippe Le Sager, 12 Apr 2019 09:41
sst-aerchem-tuning.png (94.8 KB)	Philippe Le Sager, 06 May 2019 16:35
t2m-aerchem-tuning-3.png (95.9 KB)	Philippe Le Sager, 06 May 2019 16:35
artic-SI-aerchem-tuning.png (103 KB)	Philippe Le Sager, 06 May 2019 16:35
aerchem-tuning-timeseries.pdf (376 KB)	Philippe Le Sager, 06 May 2019 16:36
artic-SI-aerchem-tuning-4.png (123 KB)	Philippe Le Sager, 29 May 2019 16:35
sst-aerchem-tuning-4.png (112 KB)	Philippe Le Sager, 29 May 2019 16:35
t2m-aerchem-tuning-4.png (123 KB)	Philippe Le Sager, 29 May 2019 16:35
aerchem-zonal-t2m-biases-4.png (111 KB)	Philippe Le Sager, 29 May 2019 16:35
t2m-aerchem-tuning-5.png (117 KB)	Philippe Le Sager, 14 Jun 2019 09:19
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sst-aerchem-tuning-Series2-1.png (112 KB)	Philippe Le Sager, 14 Jun 2019 09:34
aerchem-tuning-timeseries2-1.pdf (213 KB)	Philippe Le Sager, 14 Jun 2019 09:35
aerchem-zonal-t2m-biases-Series2-1.png (149 KB)	Philippe Le Sager, 14 Jun 2019 09:52
sst-aerchem-tuning-Series2-2.png (105 KB)	Philippe Le Sager, 01 Jul 2019 15:29
artic-SI-aerchem-tuning-Series2-2.png (112 KB)	Philippe Le Sager, 01 Jul 2019 15:29
t2m-aerchem-tuning-Series2-2.png (105 KB)	Philippe Le Sager, 01 Jul 2019 15:29
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aerchem-zonal-t2m-biases-Series2-3b.png (126 KB)	Philippe Le Sager, 11 Jul 2019 15:19
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t2m-aerchem-tuning-Series2-3.png (112 KB)	Philippe Le Sager, 11 Jul 2019 17:31
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t2m-aerchem-tuning-Series3-1.png (141 KB)	Philippe Le Sager, 11 Sep 2019 09:24
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aerchem-zonal-t2m-biases-Series3-1.png (114 KB)	Philippe Le Sager, 11 Sep 2019 16:18
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t2m-aerchem-tuning-Series3-3.png (149 KB)	Philippe Le Sager, 06 Nov 2019 12:45
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ssh-aerchem-tuning-Series3-4.png (64.4 KB)	Philippe Le Sager, 13 Nov 2019 18:20
t2m-aerchem-tuning-Series3-4.png (126 KB)	Philippe Le Sager, 13 Nov 2019 18:20
aerchem-zonal-t2m-biases-Series3-4-1850.png (118 KB)	Philippe Le Sager, 14 Nov 2019 09:36
aerchem-zonal-t2m-biases-Series3-4-1950.png (118 KB)	Philippe Le Sager, 14 Nov 2019 09:36
ssh-aerchem-tuning-Series4-1.png (56.2 KB)	Philippe Le Sager, 03 Dec 2019 16:52
aerchem-tuning-timeseries-4-1.pdf (461 KB)	Philippe Le Sager, 03 Dec 2019 16:52

t2m-aerchem-tuning-Series4-1.png (101 KB)	Philippe Le Sager, 03 Dec 2019 16:52
antartic-SI-aerchem-tuning-Series4-1.png (74.8 KB)	Philippe Le Sager, 05 Dec 2019 09:35
aerchem-tuning-timeseries-4-1.pdf (476 KB)	Philippe Le Sager, 05 Dec 2019 09:35
ssh-aerchem-tuning-Series4-1.png (64.4 KB)	Philippe Le Sager, 05 Dec 2019 09:35
t2m-aerchem-tuning-Series4-1.png (124 KB)	Philippe Le Sager, 05 Dec 2019 09:35
ssh-aerchem-tuning-Series4-2.png (72.7 KB)	Philippe Le Sager, 16 Dec 2019 10:40
t2m-aerchem-tuning-Series4-2.png (137 KB)	Philippe Le Sager, 16 Dec 2019 10:40
aerchem-tuning-timeseries-4-2.pdf (517 KB)	Philippe Le Sager, 16 Dec 2019 10:40
t2m-aerchem-tuning-Series4-2b.png (133 KB)	Philippe Le Sager, 16 Dec 2019 11:00

Subtasks

Related issues

Related to EC-Earth 3 - ~~Bug report #658~~: CFL violation in EC-Earth3-AerChem after 100 years integration	Resolved	2019-05-13		
Related to EC-Earth 3 - ~~Information request #401~~: Tuning of EC-Earth3-AerChem	Obsolete	2017-10-24		

Show details

History

All Notes Changes

Updated by **Paul Miller** over 1 year ago #1

Hi Twan,
Do you need BVOC output from LPJ-GUESS for this configuration?
Regards,
Paul

Updated by **Twan van Noije** over 1 year ago #2

Hi Paul,
No, this configuration uses prescribed vegetation and BVOC emissions from MEGAN.

Updated by **Twan van Noije** over 1 year ago #3

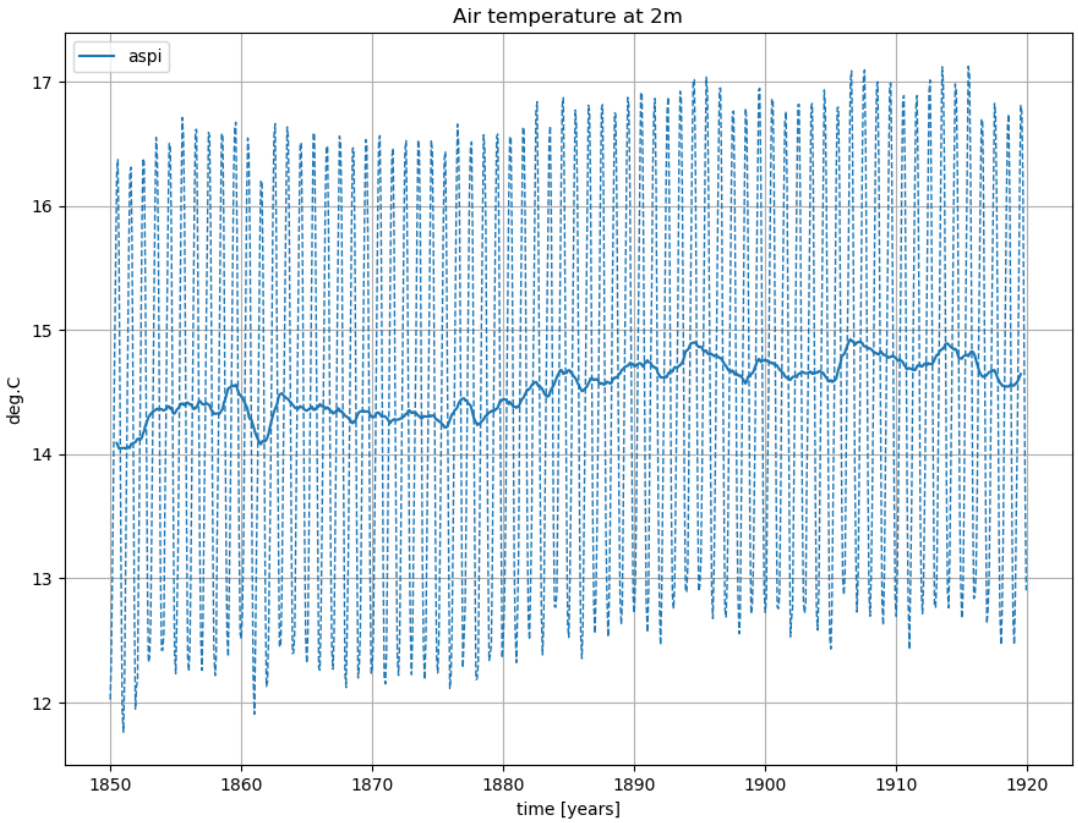
Philippe has started the spinup.

Currently the standard IFS implementation of the orbital parameters is being used. We will later decide whether or not to switch to using `LCORMBD=TRUE`. This will depend on the outcome of Shuting's new piControl (reported in #598-61 and below).

If I am correct we are currently using the same vegetation fields as in the KNMI GCM piControl simulation (corresponding to the initial state of t605; see #610-8). At the same time, the CMIP6 WG today agreed to make the GCM historical simulations using prescribed vegetation fields from t607. Assuming the same vegetations fields will also be used in the EC-Earth3-AerChem historical simulations, we decided to switch the vegetation fields applied in the EC-Earth3-AerChem spinup (and piControl) to the 1850 fields from t607, once these have been made available.

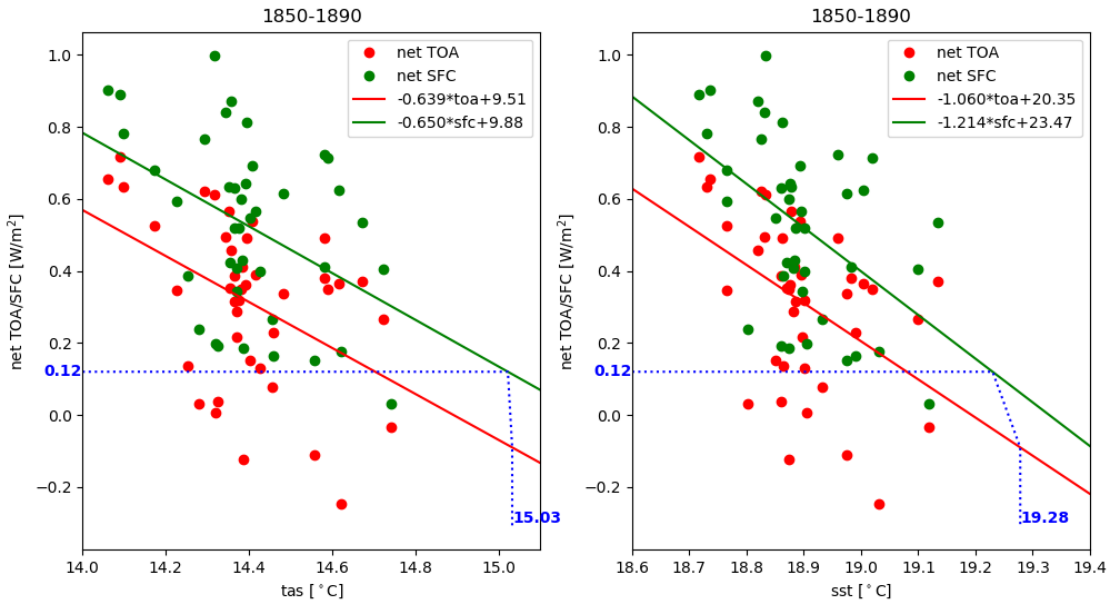
Updated by **Philippe Le Sager** over 1 year ago #4

Spinup has reached 40 years. It started from the member 25 of the AOGCM historical initial states (for oasis/nemo/ifs), and from Tommi Bergman "piap" 15-year run with 1750 settings for TM5. After 10 years, we switch to the `icmcl_v32` for the vegetation. Here is the `t2m` time serie:



You canfind the other time series in the aerchem-spin-timeseries.pdf file.

And here's the Gregory plot:



Updated by **Twan van Noije** over 1 year ago #5

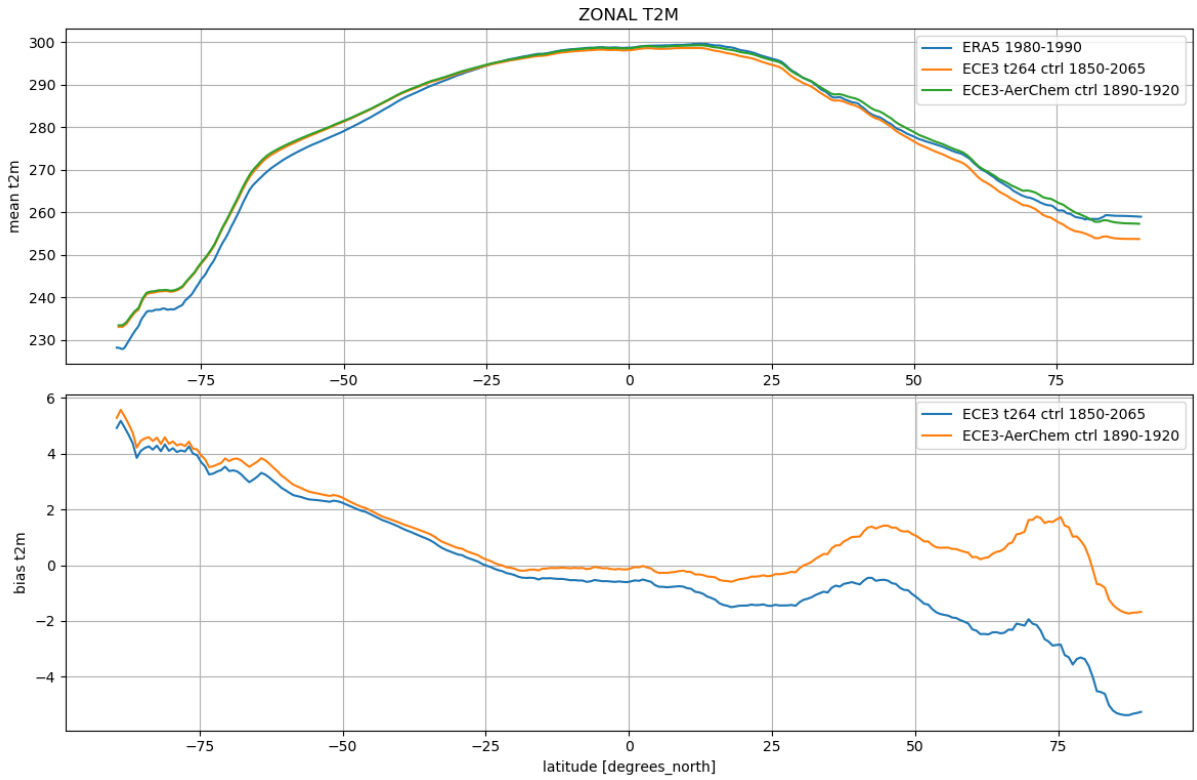
I am trying to estimate the contribution of the Southern Ocean warm bias to the global mean temperature. As a first approximation we could define the region to be affected by the warm bias as the polar cap south of a certain latitude (lambda), say -45 or -60 degrees. The fractional area of this cap relative to the surface of the Earth is 0.5(1-sin(|lambda|), which is equal to 0.146 at -45 degrees and 0.067 at -60 degrees. To get the contribution to the global mean temperature, these numbers have to be multiplied with the mean temperature bias over the region. For instance, if the mean temperature bias over the region south of -45 degrees would be 3 K and there would be no bias over the rest of the world, the bias in the global mean would be 0.146 x 3 = 0.44. In order to estimate a reasonable range for the global mean temperature that we could use for tuning the model, we need to know how large the correction really is in our simulations. Do we know how large the mean bias over the cap south of, say, -45 degrees is in our simulation?

Updated by **Philippe Le Sager** about 1 year ago #6

Updated the timeseries posted above (~~#614-4~~) with 20 additional years.

Updated by **Philippe Le Sager** about 1 year ago #7

Following on Twan's idea, here is a plot of the T2M bias at every latitude. The reference is computed from ERA5 monthly data. Two biases are available: one for the AOGCM control run (t264 experiment, see #598-45) and the other for the EC-Earth3-AerChem (see ~~#614-4~~ above).



It is quite interesting to note that

- although warmer on a global average, the AerChem model is closer to ERA5 in the northern hemisphere and the equatorial region
- in the southern hemisphere, the difference between the models is a lot smaller, pointing to the difficulty to remove the bias there

Accepting that the global temperature is 0.4-0.5 degree colder in 1850 (GISS/NASA) than in 1980-1990 (the oldest ERA5 currently available), should we try to lower the northern hemisphere temperature by 0.5 or even 1 degree? @Jost: how could we attain that?

Updated by **Philippe Le Sager** about 1 year ago #8

Jost gave us the following recommendation:

```
I tried to
1) change as few parameters possible
2) change parameters only getting closer to the cy40 values, not farther (at the end of t
3) change both snow and convection parameters in order not not impact only on specific re

My results are as follows (assuming I cannot change RLCRIT_UPHYS)
```

For a change of -0,5°C I would recommend to try:

	Original	New	Impact on Net SFC
RSNOWLIN2	0,035	0,03	-0,200

ENTRORG	1,7	1,75	-0,124
			-0,324 (DT = -0,498)

For a change of -1°C I would recommend to try:

	Original	New	Impact on Net SFC
RSNOWLIN2	0,035	0,028	-0,280
ENTRORG	1,7	1,75	-0,124
RLCRIT_UPHYS	0,875	0,893	-0,248
			-0,652 (DT=-1,003)

If you wish to achieve -1°C, WITHOUT touching RLCRIT_UPHYS (because you are happy with the current forcing due to cloud activation) the following combination would also work:

	Original	New	Impact on Net SFC
RSNOWLIN2	0,035	0,028	-0,280
ENTRORG	1,7	1,8	-0,247
ENTRDD	3	2,75	-0,125
			-0,652 (DT=-1,004)

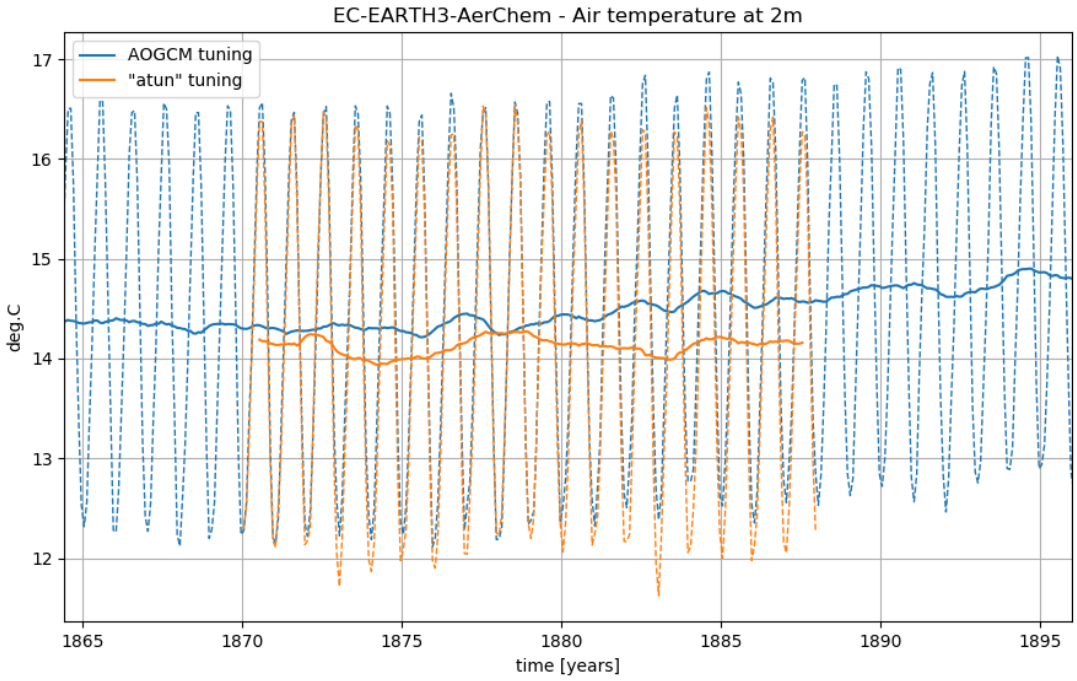
```
The nice thing is that in both cases  ENTRORG is set to the same value as cy40 and RSNOWL
Of course all this is very approximate and assumes that the old sensitivities which we ar
```

Updated by **Philippe Le Sager** about 1 year ago #9

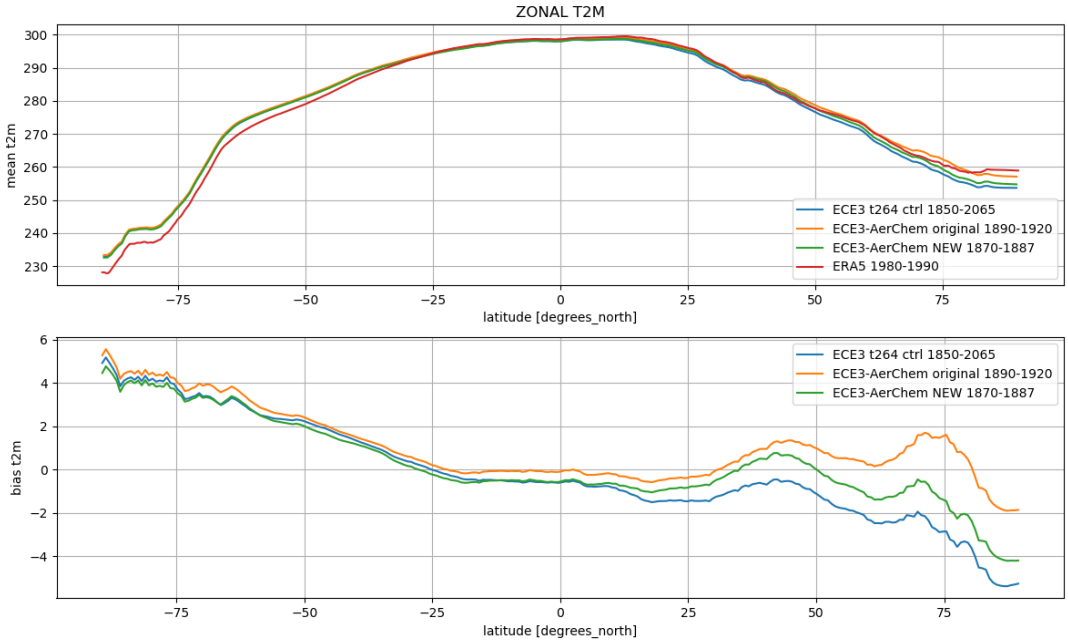
We targeted a decrease of 0.75 degree by using values:

RSNOWLIN2 = 0.029
ENTRORG = 1.75
RLCRIT_UPHYS = 0.884

The overall T2m shows a decrease of about 0.5 degree (orange curve is the one with the new tuning parameters):



And here are the zonal mean and bias w/r/t ERA5:



Updated by **Jost von Hardenberg** about 1 year ago #10

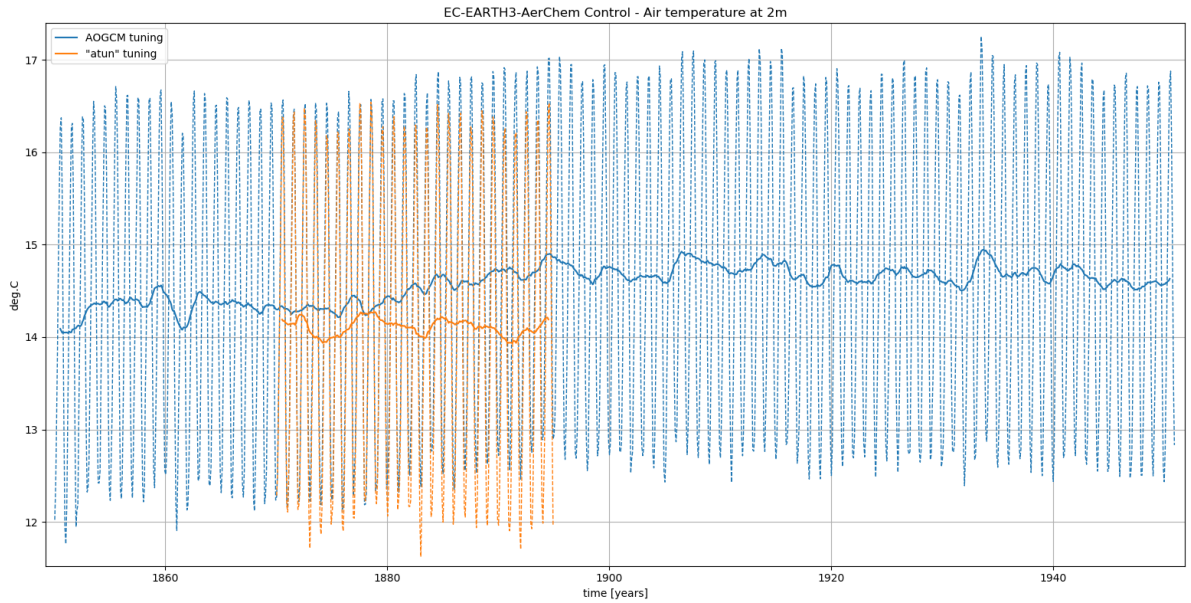
Ok, so indeed the norther temperatures have been reduced significantly, as hoped for, while the southern bias has not changed. Interesting. Should we aim at an ever stronger reduction in northern temperatures ?
Maybe you could continue with the parameters which I computed above for a 1° C reduction ....

Updated by **Twan van Noije** about 1 year ago #11

Let's continue both runs, and see at which level the simulation with retuned parameters will stabilize. I think it would be just fine if the temperatures would remain close their current levels. At this stage, I don't think we should try cooling it down further.

Updated by **Philippe Le Sager** about 1 year ago #12

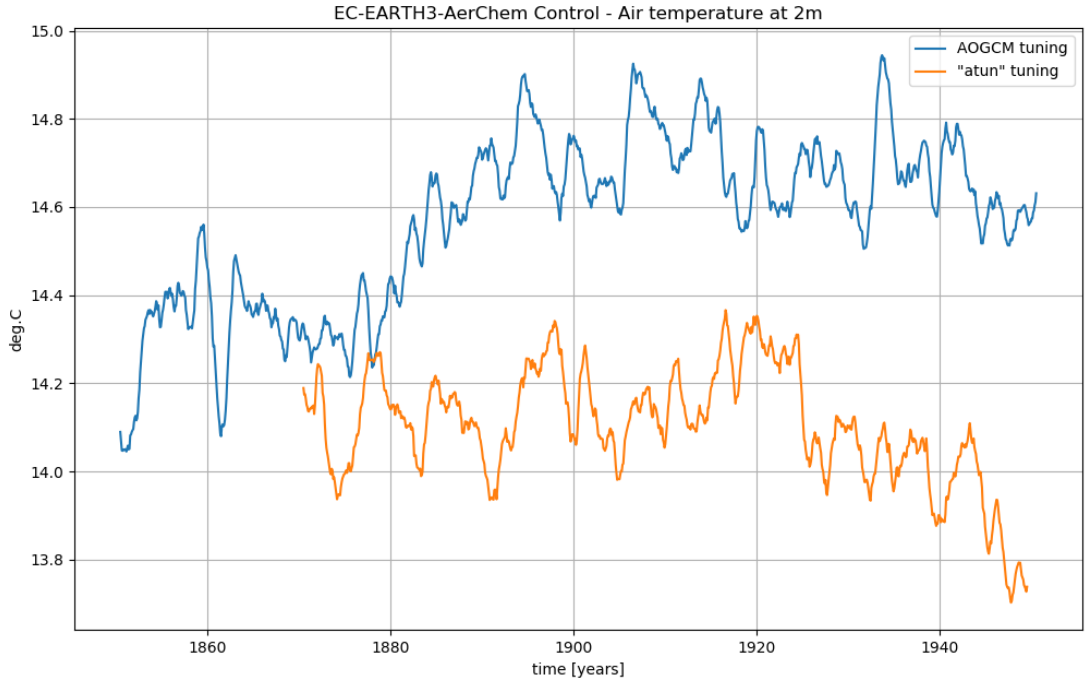
The run with AOGCM has reached 100 years, and the one with updated tuning parameters 25 years. Here's the full timeseries of T2M:

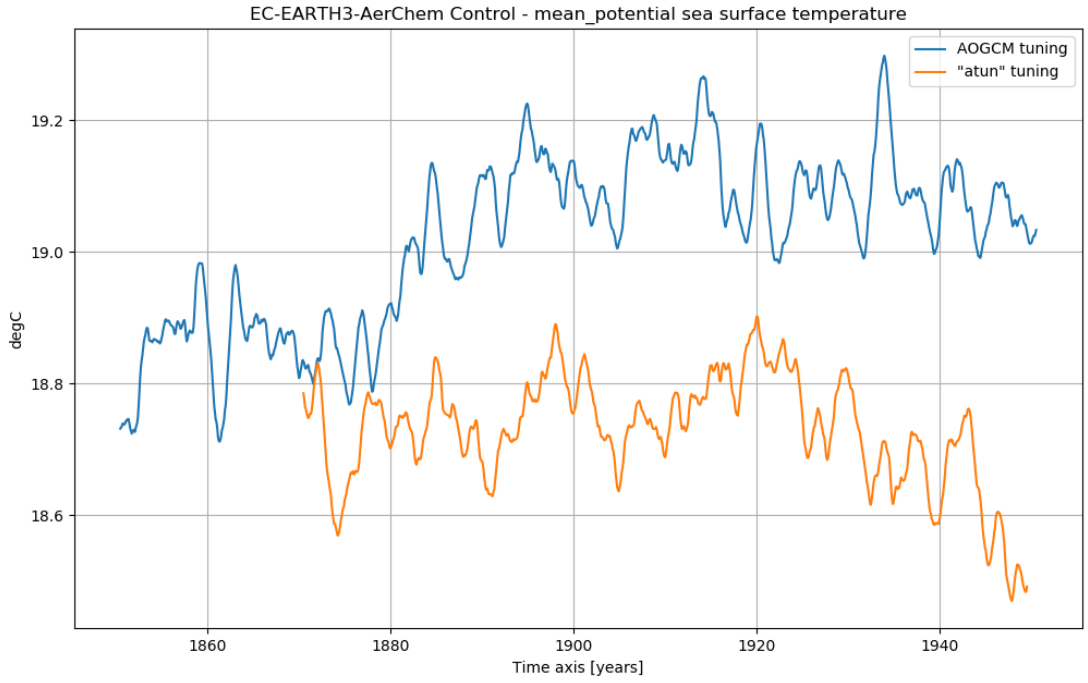


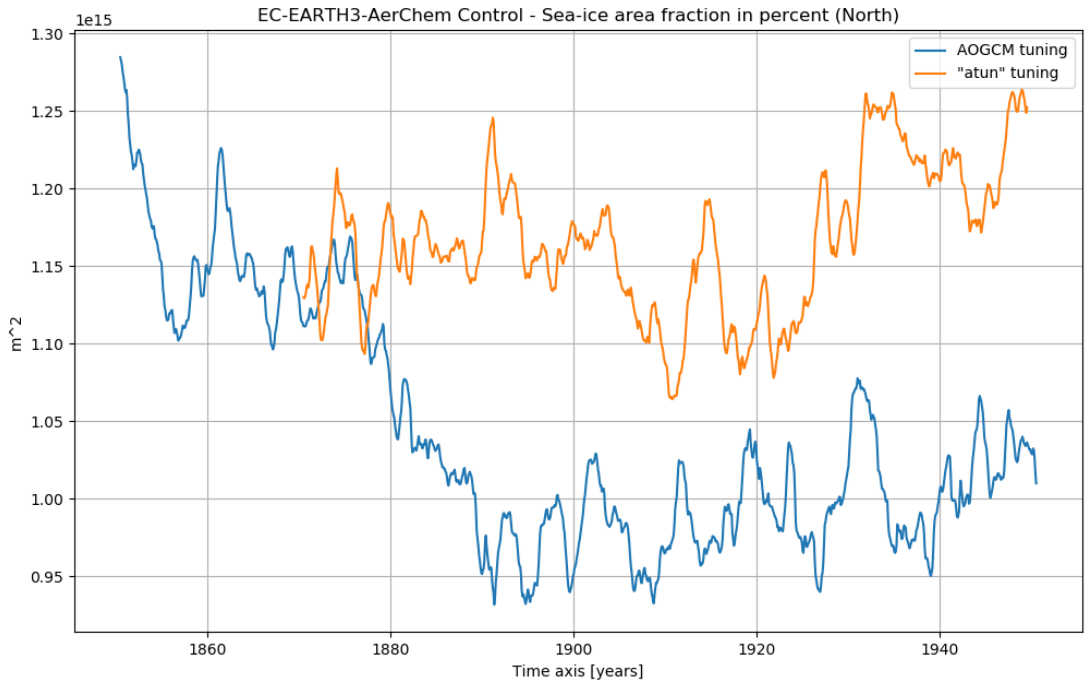
This looks pretty steady, and indeed the zonal biases shown in the previous post have not changed.

Updated by **Philippe Le Sager** about 1 year ago #13

The run with updated tuning parameters has reached 100 years. Note the drop in temperature in the last 20 years, which is accompanied by an drop in sst and an increase in Artic Sea Ice:


EC-EARTH3-AerChem Control - Air temperature at 2m
AOGCM tuning
"atun" tuning
deg.C
time [years]

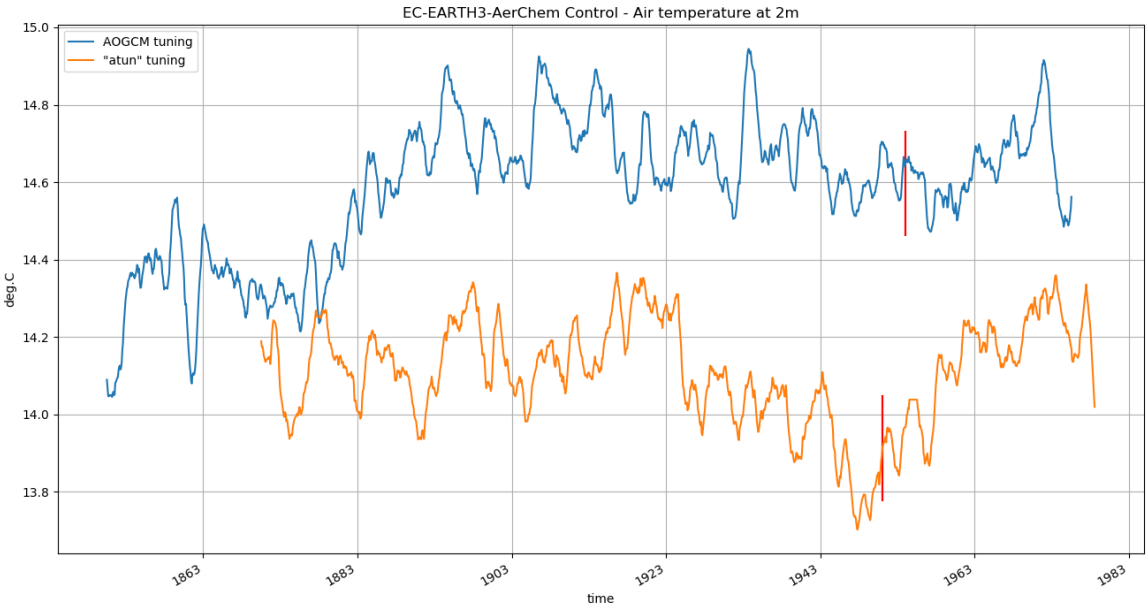

EC-EARTH3-AerChem Control - mean_potential sea surface temperature
AOGCM tuning
"atun" tuning
degC
Time axis [years]

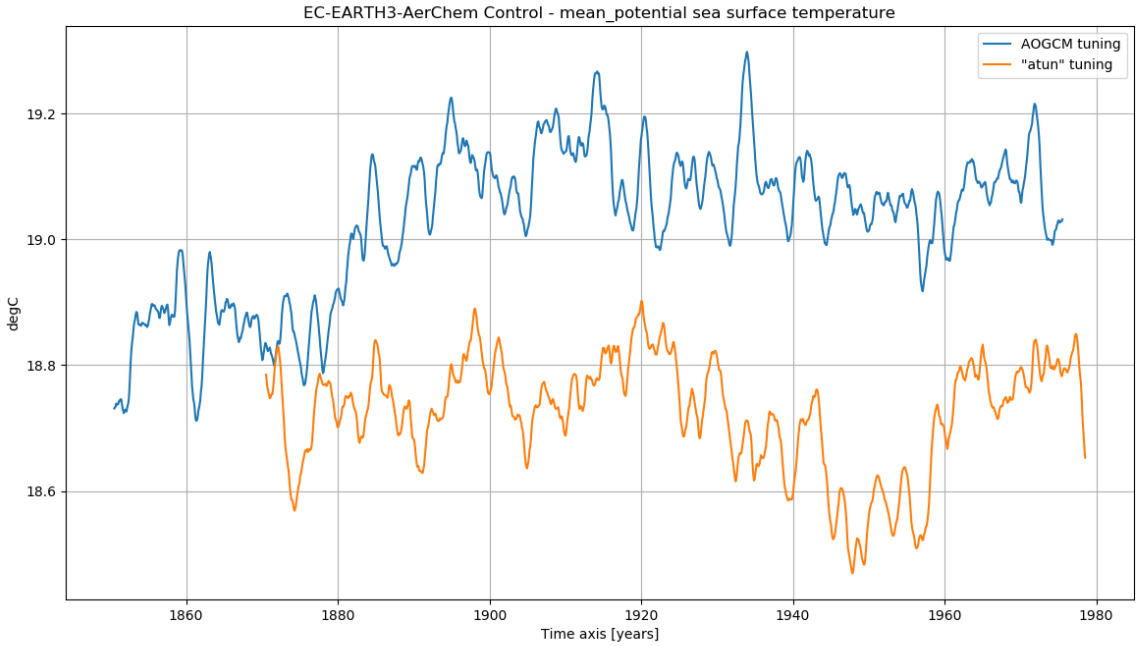


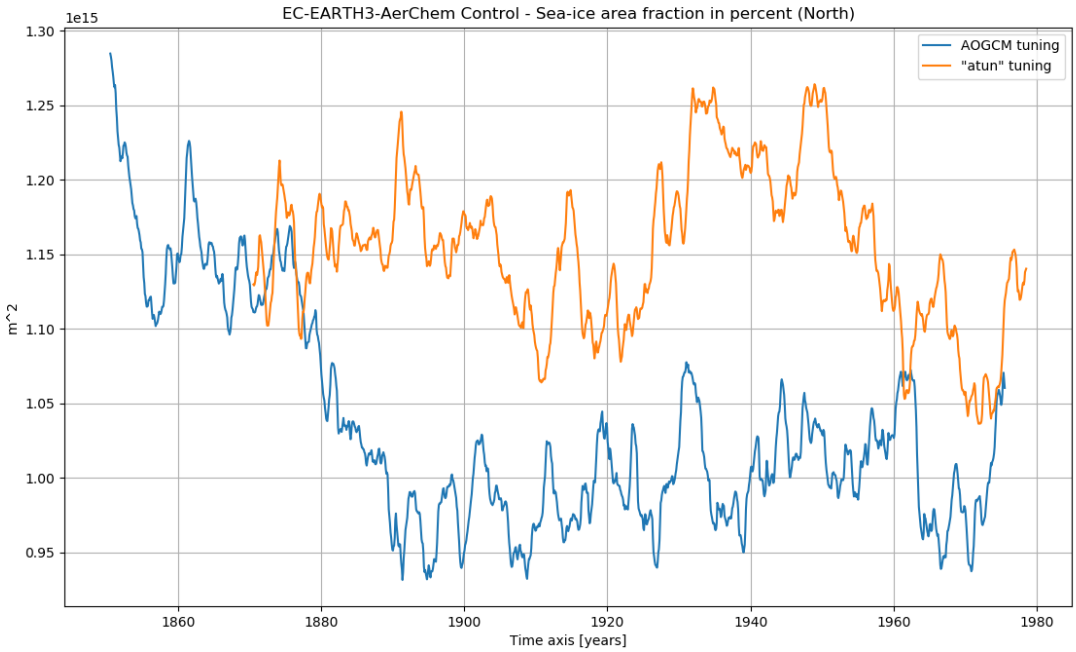
More timeseries available in aerchem-tuning-timeseries.pdf.

Updated by **Philippe Le Sager** about 1 year ago #15

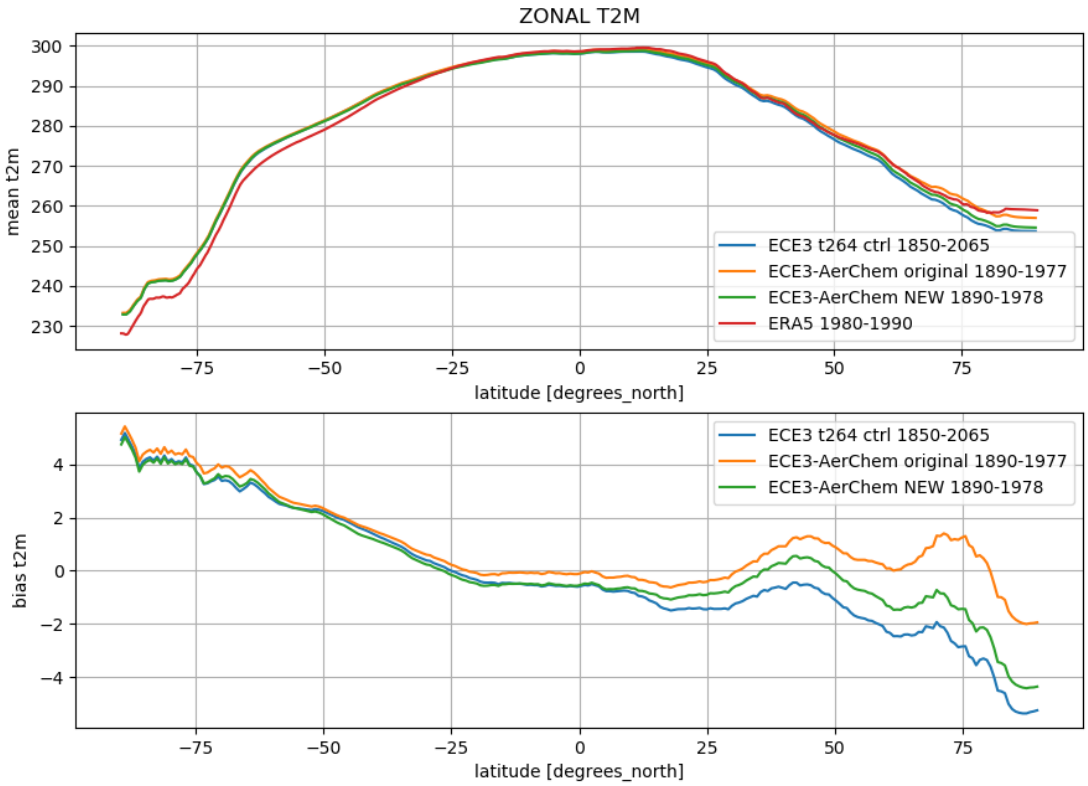
After a little bit more than 100 years or so, both tuning/spinup runs crashed with a CFL violation in TM5. That particular issue has been investigated in ~~#658~~. By applying the first fix mentioned in that issue (i.e. reset the surface pressure to the one received from IFS after each restart), I was able to restart and continue the runs. Here is the status 25 years further down the road (the vertical red lines in the first plot indicate where the runs crashed). With the second set of tuning parameters (`atun` experiment), T2M/SST recovered from the drop mentioned in the previous post, back to an average of 14.1 C for T2M. This is again concomitant to the decrease in artic sea ice:







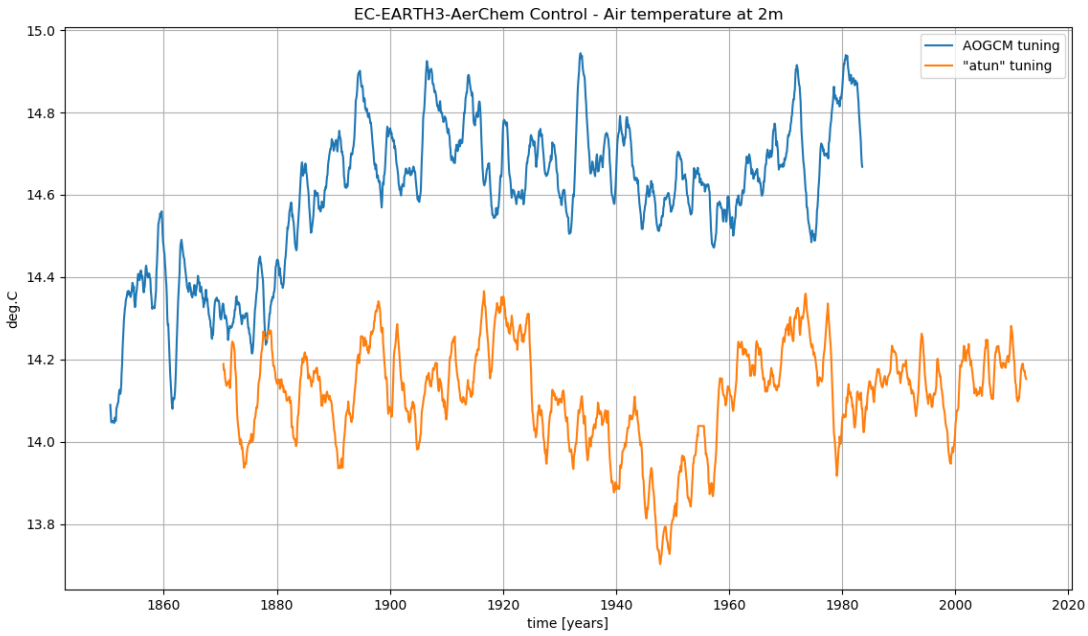
The zonal bias w/r/t ERA5 for both experiments has not changed much:



I will leave the experiments running over the coming weekend, if only to check how stable this is (although if we have to expect 100 years swing, we will never have the final word). I have started two other experiments before the meeting in Reading. They used a newer version of the code, where the IFS surface pressure is accounted for at every coupling step. They are close to 25 years. Timeseries coming soon.

Updated by **Philippe Le Sager** 12 months ago #16

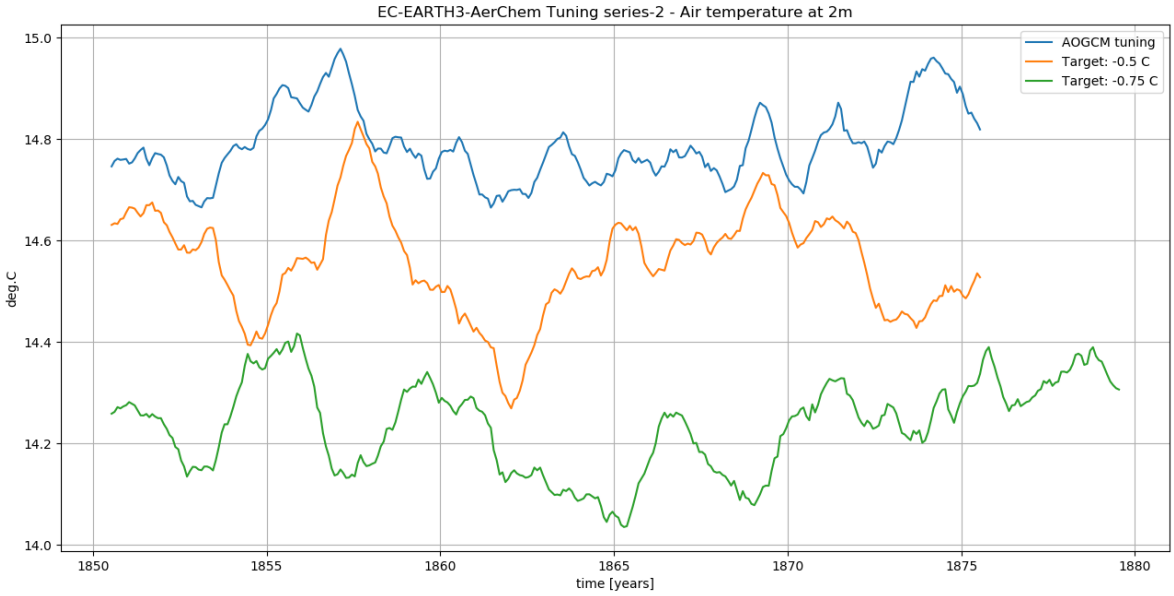
First update on the initial two runs we have been looking at so far:

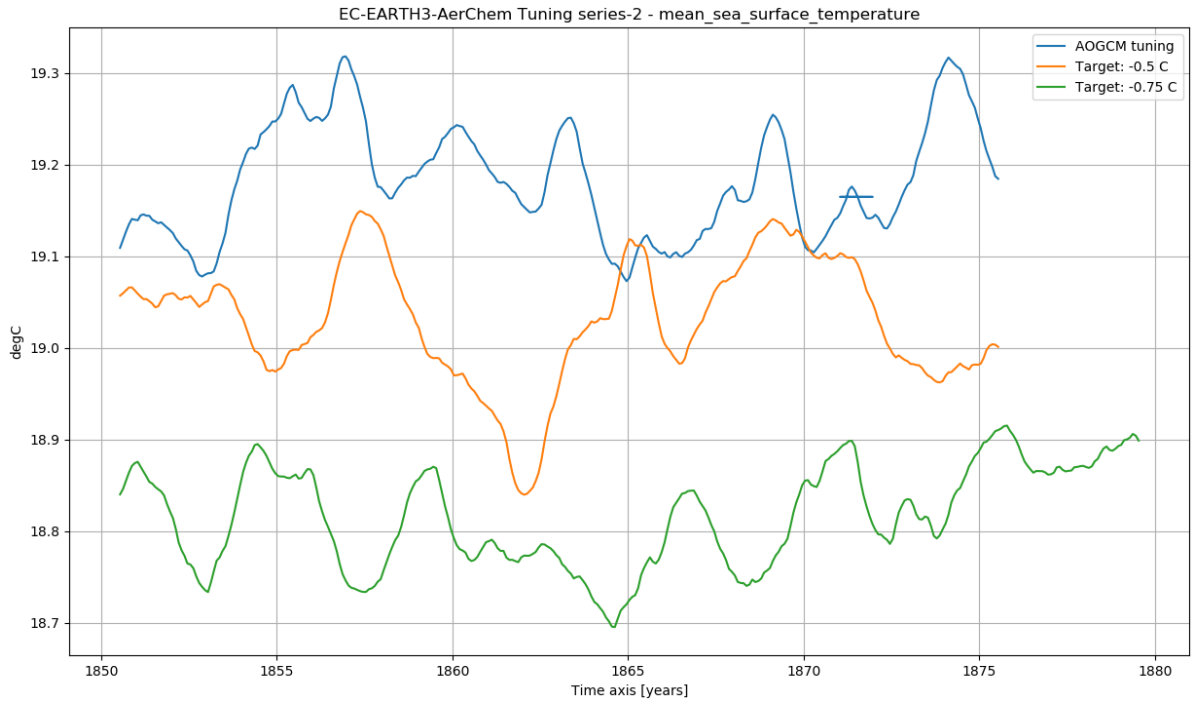


No big news, quite steady. The `atun` recovery after the drop in 1950s is still holding. The aerchem-tuning-timeseries-2.pdf provides the other series.

Updated by **Philippe Le Sager** 12 months ago #17

A new set (I call it series-2) of experiments was launched with the latest version of the model. That is, the tracer mass is conserved at every restart (instead of the mixing ratio). The tuning parameters are: same as AOGCM, targeting -0.5 C, and targeting -0.75 C in the global mean temperature. The first two started from the 1970 state of the AOGCM of the series-1. The third one started from the 1970 state of the "atun" from series-1 (same tuning parameters). Here are the surface temperatures after 25+ years:

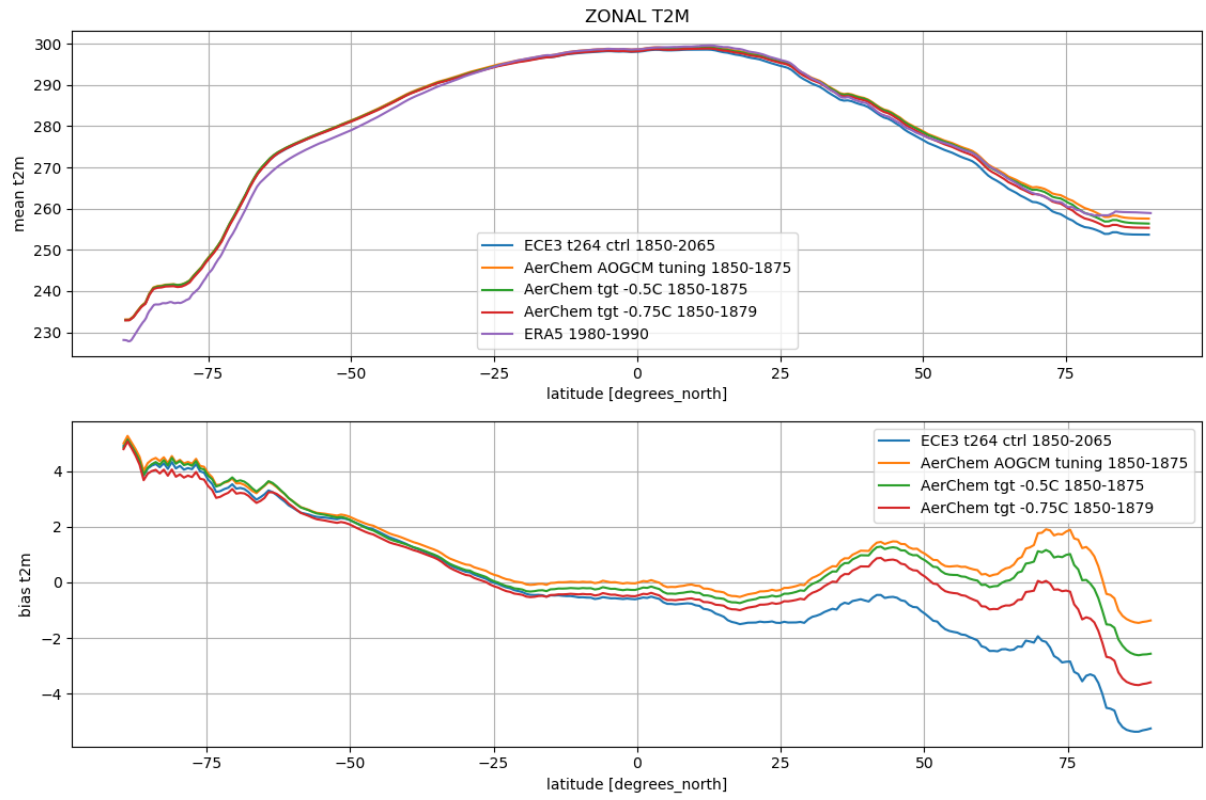




See aerchem-tuning-timeseries2-1.pdf for more time series.

Updated by **Philippe Le Sager** 12 months ago #18

From the new series of run, here is the zonal mean and bias w/r/t ERA5-1980s for T2M:



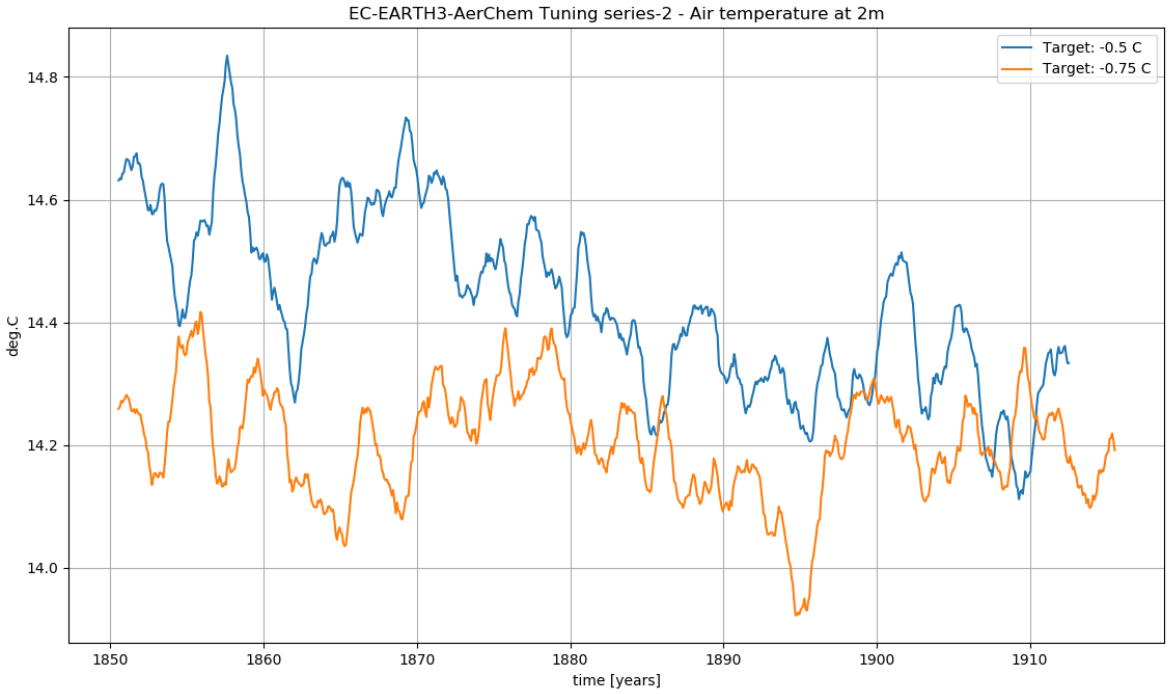
Again very little if any change in the South hemisphere.

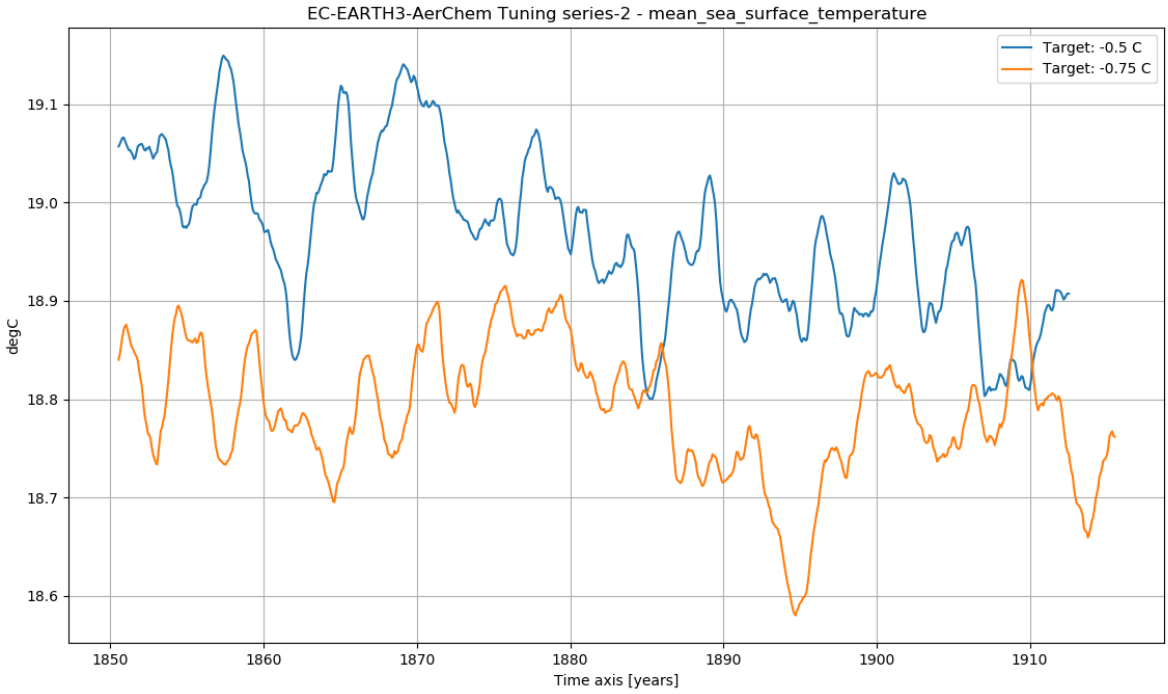
Updated by **Philippe Le Sager** 12 months ago #19

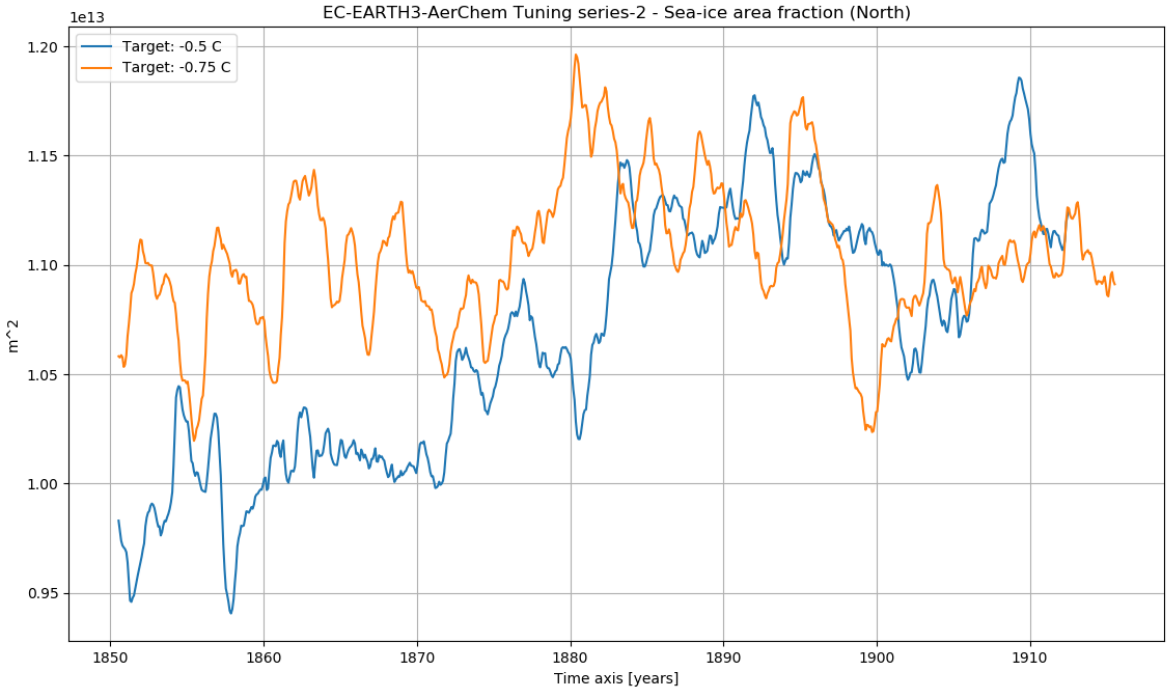
During the EC-Earth3-AerChem telecon this morning, we decided to continue with `target-0.5` and `target-0.75` runs, and stop the other ones. Favorite candidate for the final version is `target-0.75` (i.e. the continuation of `atun` from Series-1). CMIP6 output will be switched on as soon as the model is synced with 3.3.1.1 (we will remove O3 from IFS output request, see ~~#656 2~~). That will indicate the switch from spinup to PI-control.

Updated by **Philippe Le Sager** 12 months ago #20

The two runs have reached 60+ years. Here's an overview. First the surface temperatures and artic ses-ice:

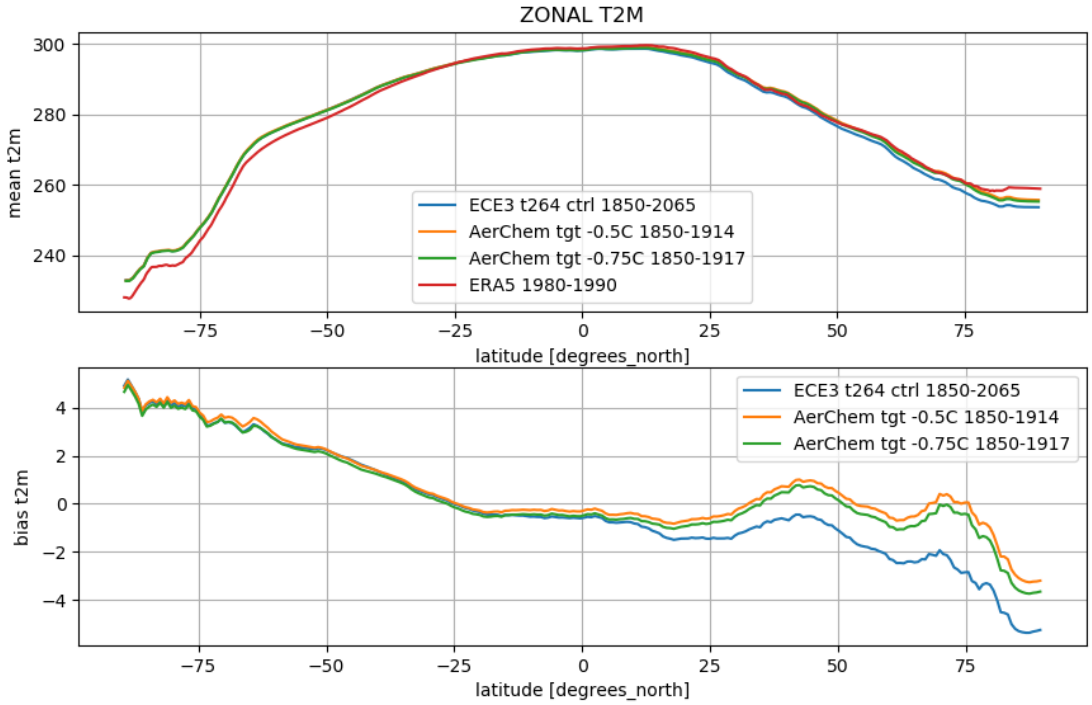






The -0.5C-target is getting colder and closer to the -0.75C-tgt run. This leads to similar arctic ice extend.

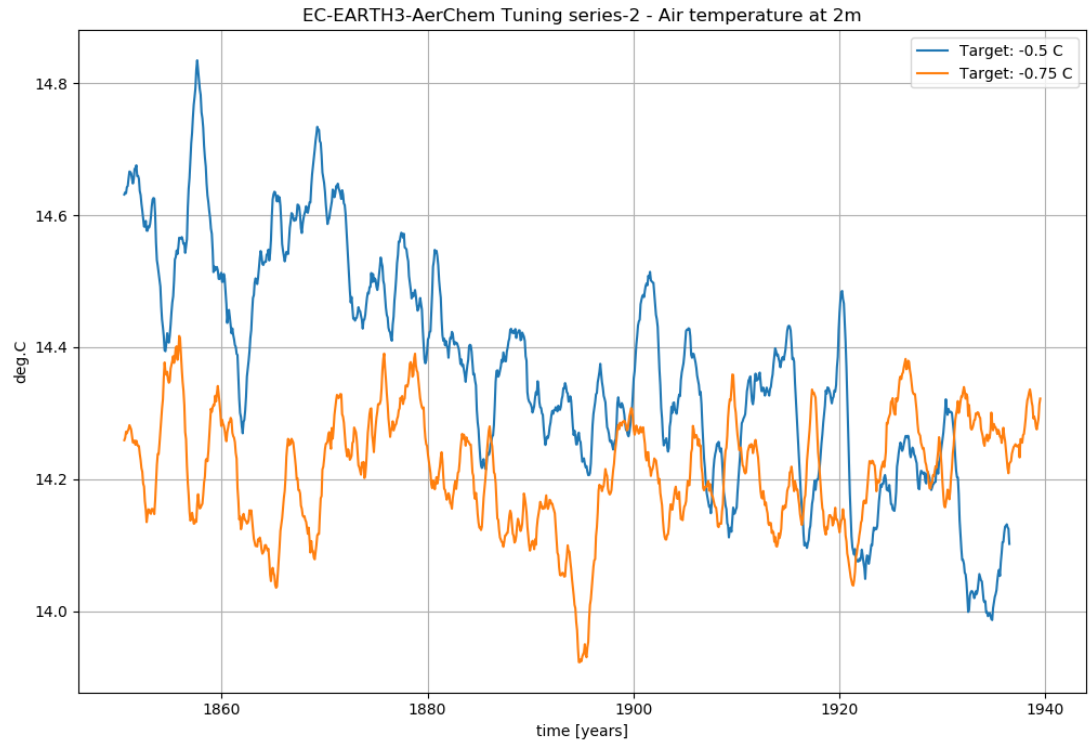
The convergence of the two runs is also visible in the zonal mean of t2m:

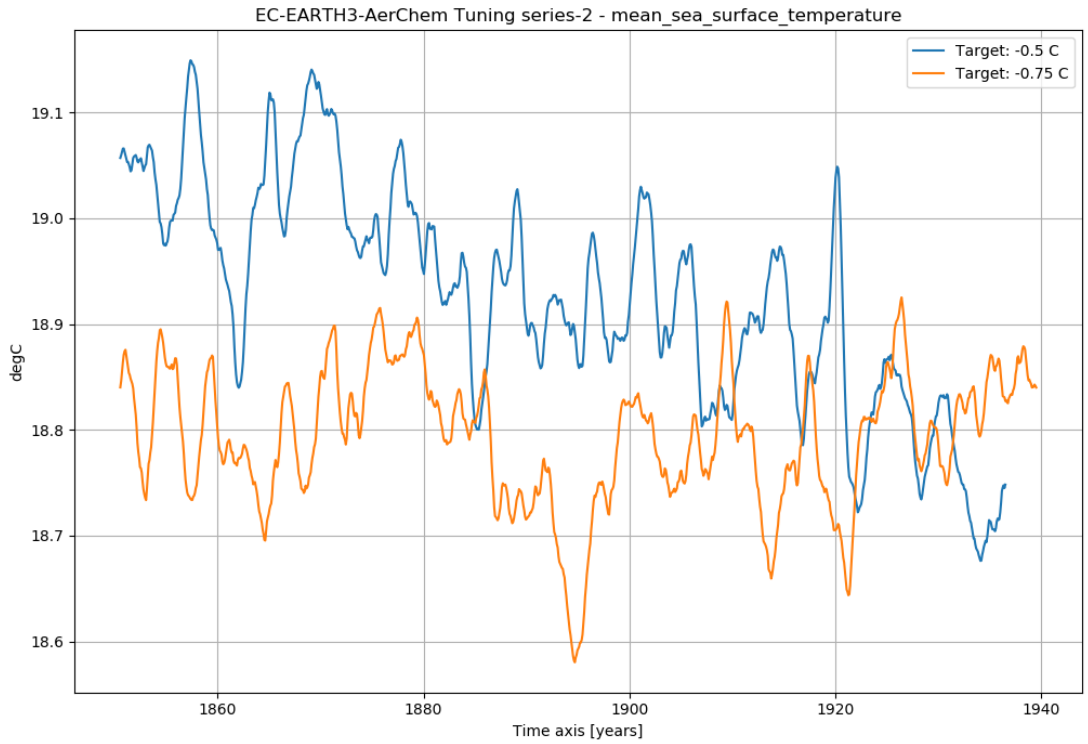


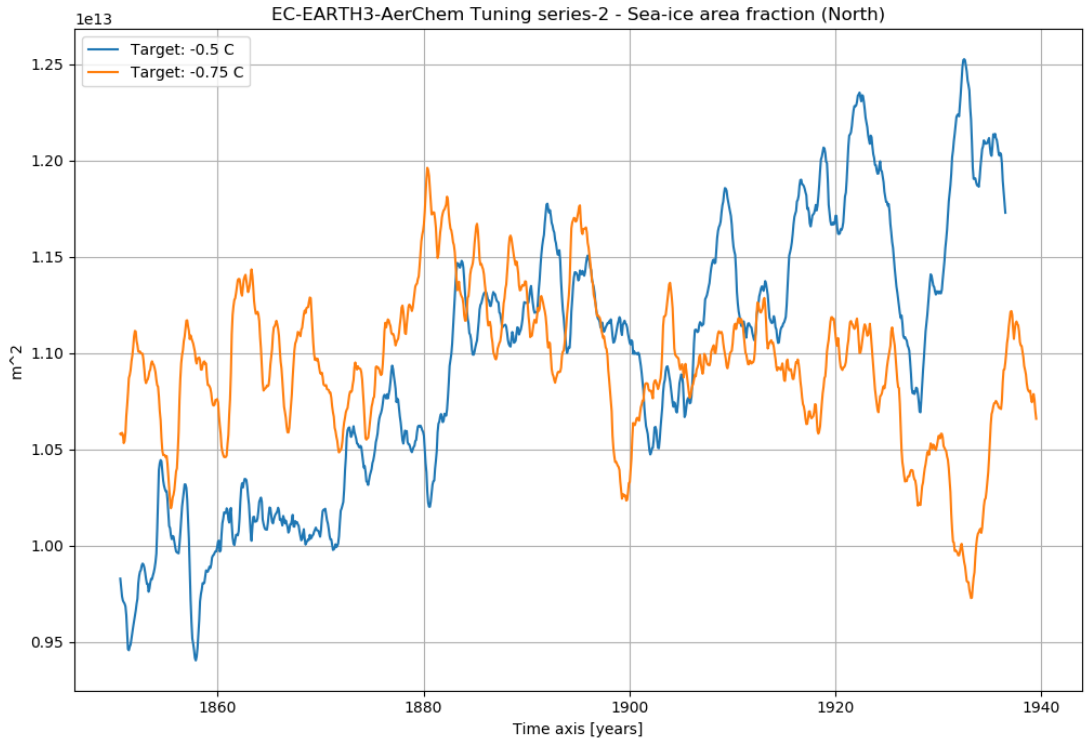
Note that the -0.75C-tgt seems steady. For the -0.5C-tgt we need more years to see if it will get warmer again.

Updated by **Philippe Le Sager** 11 months ago #21

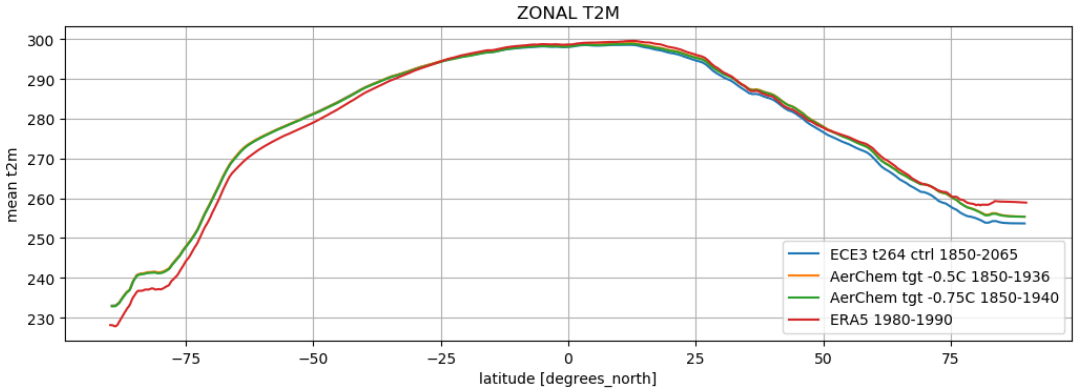
With an additional 20 years into the runs:

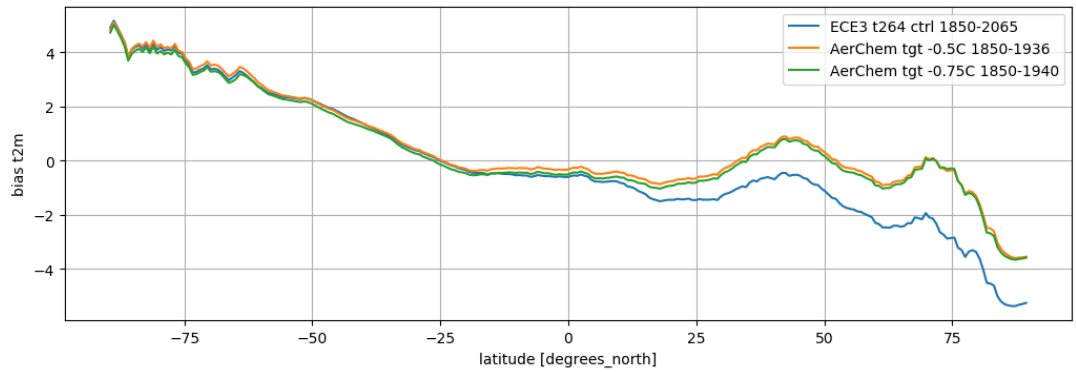


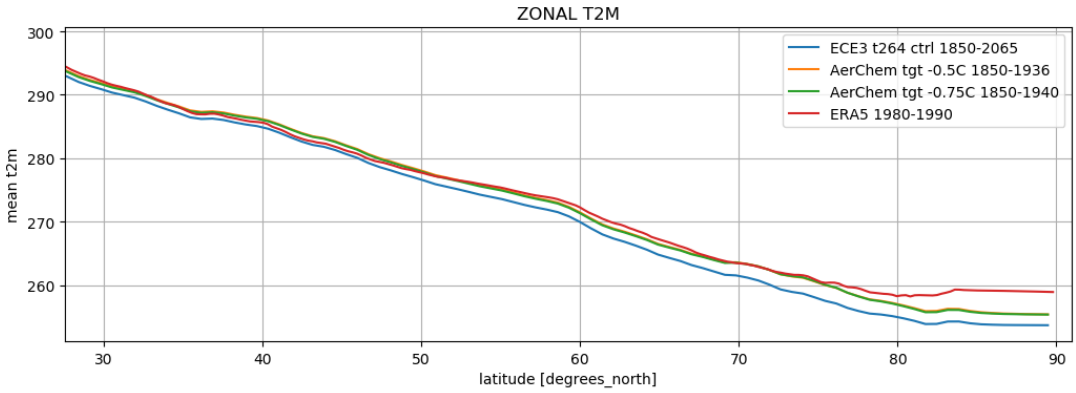


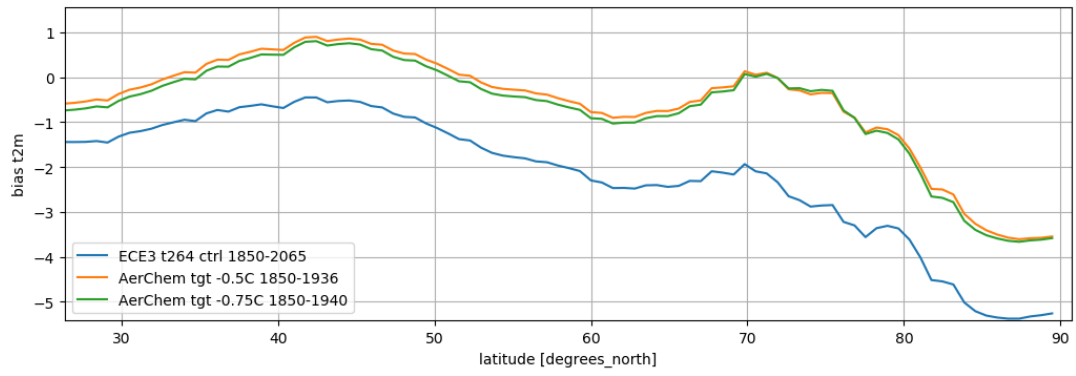


And a closer look at the zonal mean surface temperature:







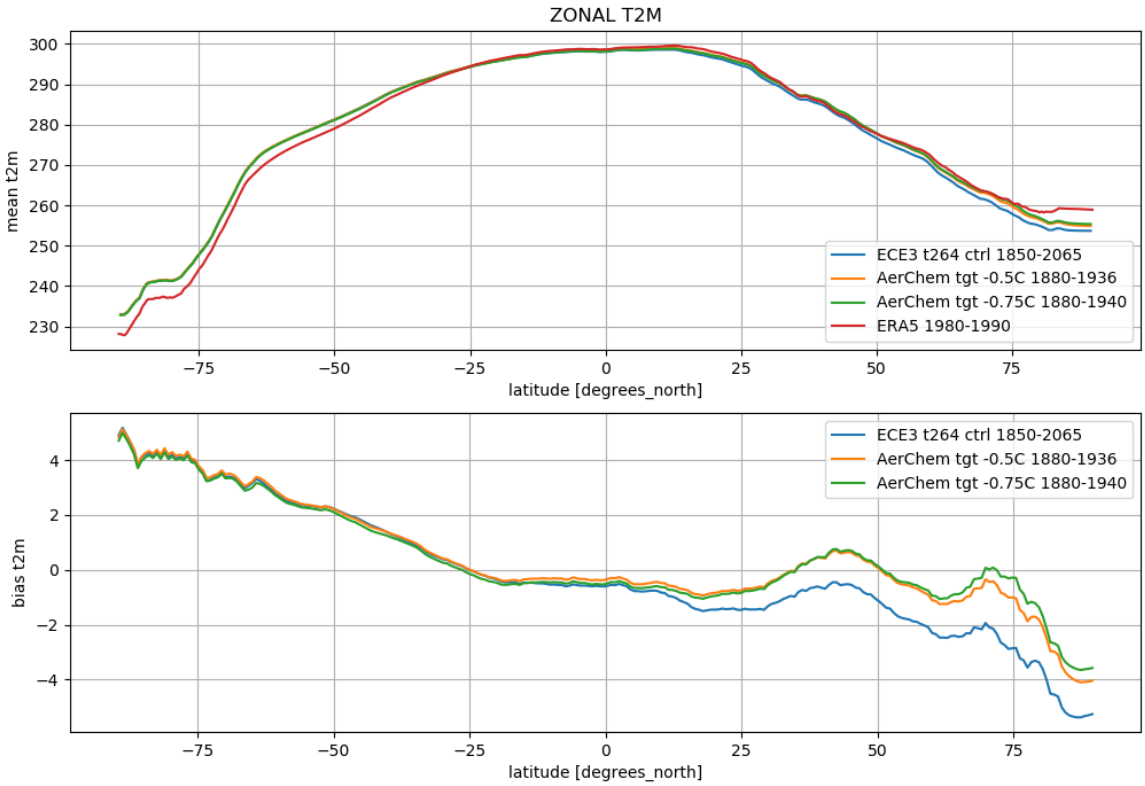


Updated by **Tommi Bergman** 11 months ago #22

Philippe, could you do also a version of the bias where the beginning is left out. So from 1880 or so onwards, just see how the beginning where they differ the most affects the result.

Updated by **Philippe Le Sager** 11 months ago #23

Good point Tommi. We have indeed some concern with the trend in the -0.5C experiment: **it is getting colder than the -0.75C one**!! Here are the biases limited to the 1880-onwards series:



CORRECTION I have updated the plots in the previous post (~~#614-21~~) to go up to 1940 or so. And find in the aerchem-tuning-timeseries2-3.pdf all the other time series. I do have the Barakuda plots. I will try to put it in the cloud later tonight or tomorrow before the telecon.

Updated by **Philippe Le Sager** 11 months ago #24

Barakuda plots are available on this KNMI page.

Updated by **Philippe Le Sager** 11 months ago #25

~~Ok, problem with the link above.~~ Fixed! Head to the KNMI Barakudas. You can also download an offline version of the Barakuda web pages from here

Updated by **Philippe Le Sager** 11 months ago #26

Just added several watchers since **we are reaching out to NEMO and/or TUNING experts still around.** Here's the story:

We are tuning the AerChem version of EC-Earth3. Two candidates: one aiming at -0.50 and the other at -0.75 degree colder than the initial run with AOGCM tuning parameters. After about 90 years, the -0.75 looks more stable than the -0.5, which is even getting colder than the -0.75! We would settle for the -0.75 but, checking the barakuda plots, we noticed the increasing sea surface height. See page 15 of aerchem-tuning-timeseries2-3.pdf or compare these Barakuda plots: for -0.5 (rose by 2.5 cm in 86 years) and for -0.75 (8 cm in 90 years). Should this 8 cm/century concern us or can we live with it? Any opinion?

Updated by **Pablo Ortega** 11 months ago #27

Hi Philippe.
I think that the SSH trend is just an indicator that the ocean is still not stabilized, as it is indeed matching really well the warming trend in global average temperatures. You might want to extend the experiments for a few more years until the reach an equilibrium.

Updated by **Klaus Wyser** 11 months ago #28

It is possible that the trend you see could just be a manifestation of the fact that the model hasn't reached a steady state yet and things may stabilize after a while. But it could also be a tuning issue, here are two ideas.

Where does the extra water in your runs come from? Could it come from sea ice? Unfortunately I cannot find the sea ice volume timeseries in your Barakuda plots. If the SSH increase comes from melting sea ice then you could consider re-tuning the thermal heat conductvity of snow over sea-ice.

There could also be a systematic difference between EC-Earth3 and EC-Earth3-AerChem, namely in the E-P imbalance. In a perfect model E-P would be 0, but we know that this is not the case in EC-Earth3 and therefore compensate for the imbalance by adding a multiplicative correction to the runoff. This factor was set based on our first tuning results with EC-Earth3, and it wouldn't surprise me if you would have to change it for model model configurations. The factor can be easily computed by dividing the E-P imbalance by the runoff (long term averages).

Updated by **Twan van Noije** 11 months ago #29

Thank you both. As NEMO is volume conserving, we assume the SSH drift must be caused by a net influx of freshwater into the ocean, in line with Klaus' suggestions. Philippe, for your information the E-P imbalance and runoff correction is also discussed in https://dev.ec-earth.org/issues/636.

Updated by **Twan van Noije** 11 months ago #30

See also the discussion in https://dev.ec-earth.org/issues/252:

"There will always be the oas_mb_fluxcorr variable in the run script to remind us that this is a tunable parameter."

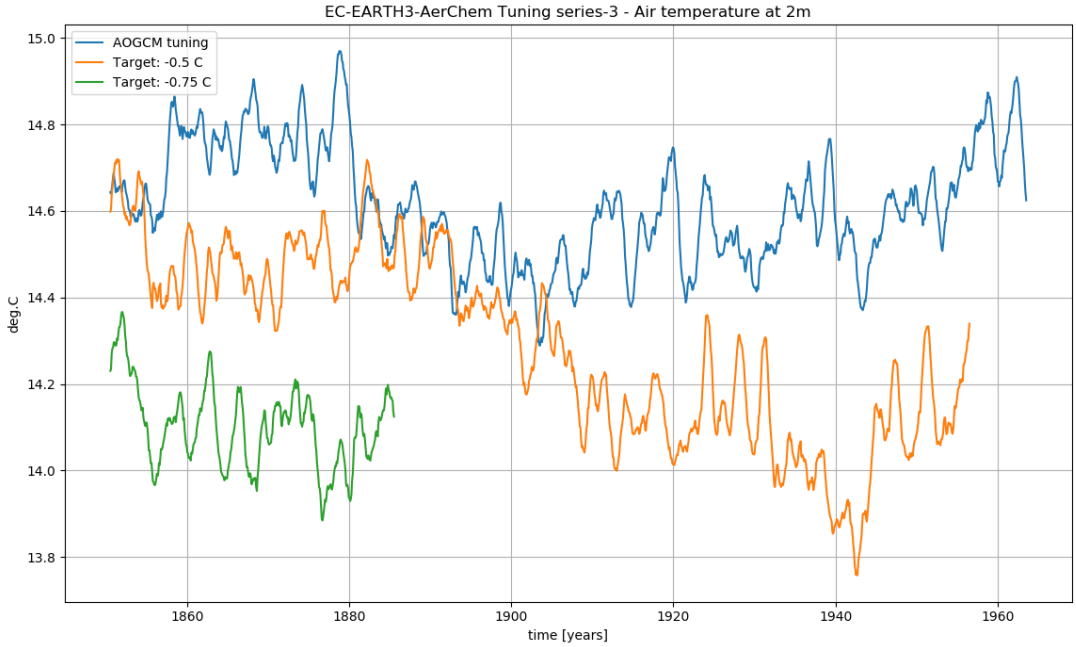
(https://dev.ec-earth.org/issues/252#note-57).

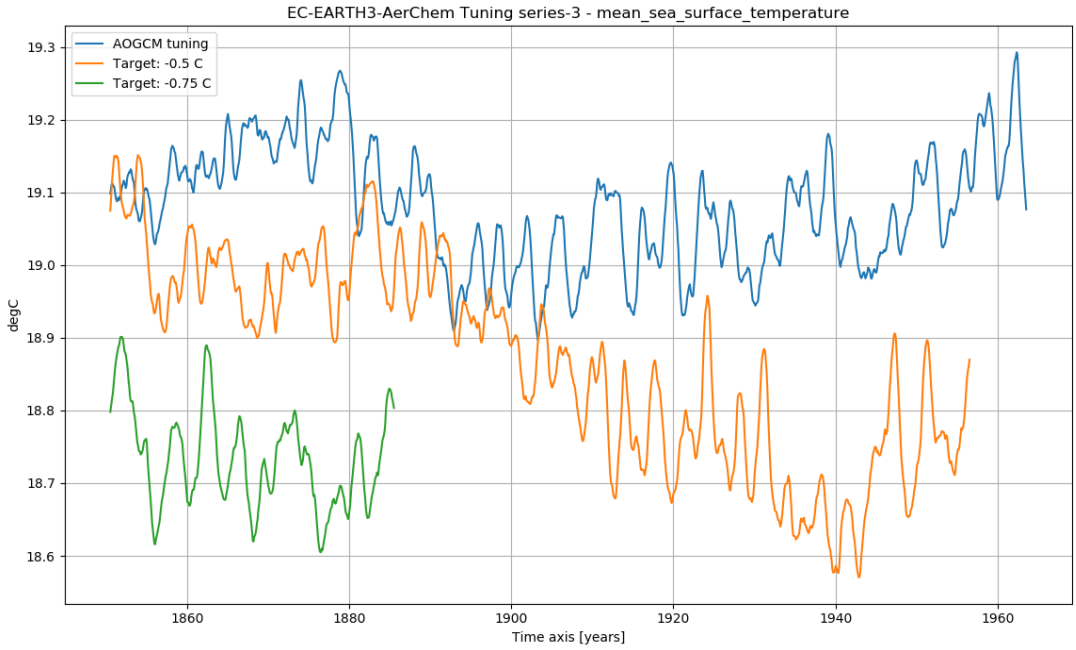
Updated by **Philippe Le Sager** 11 months ago #32

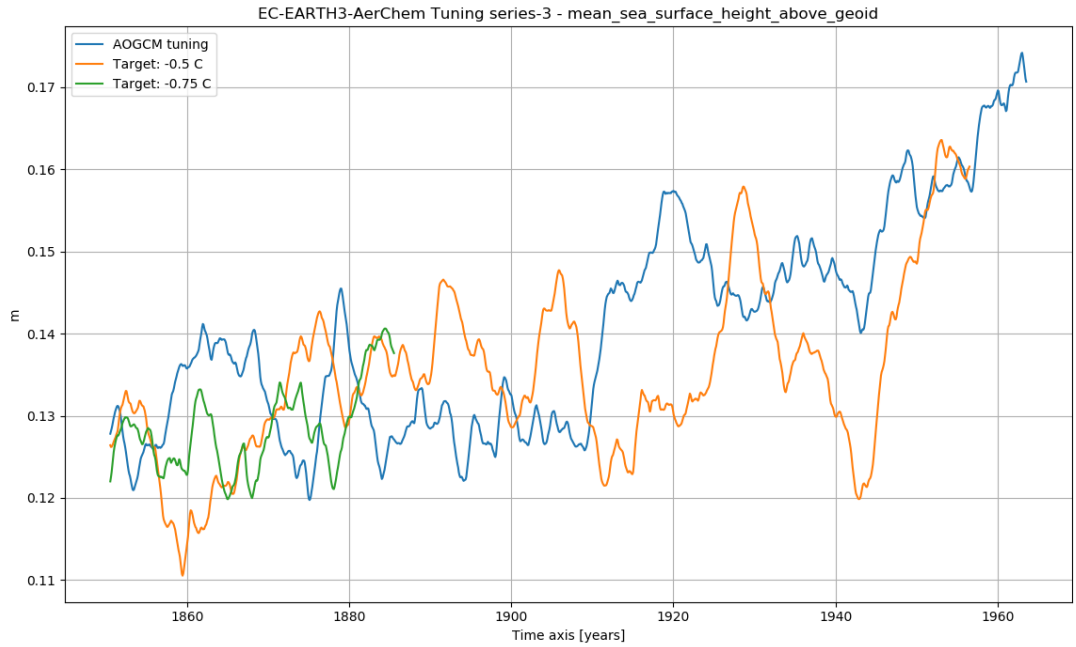
After a closer look at the results, we found out that the dust emissions are too low (~550 Tg/year). One of TM5 tuning parameters, the scale factor for threshold friction velocity, determines the dust emissions. It was set to 0.7 for EC-Earth 3.2.3. In r7038, it is set to 0.6, its offline value when TM5 is driven by ERA-Interim. I have restarted three spinup runs with the new dust emissions. From the first 6 years, dust emissions increase to about ~1100 Tg/year. Results will be further examined in 5 weeks.

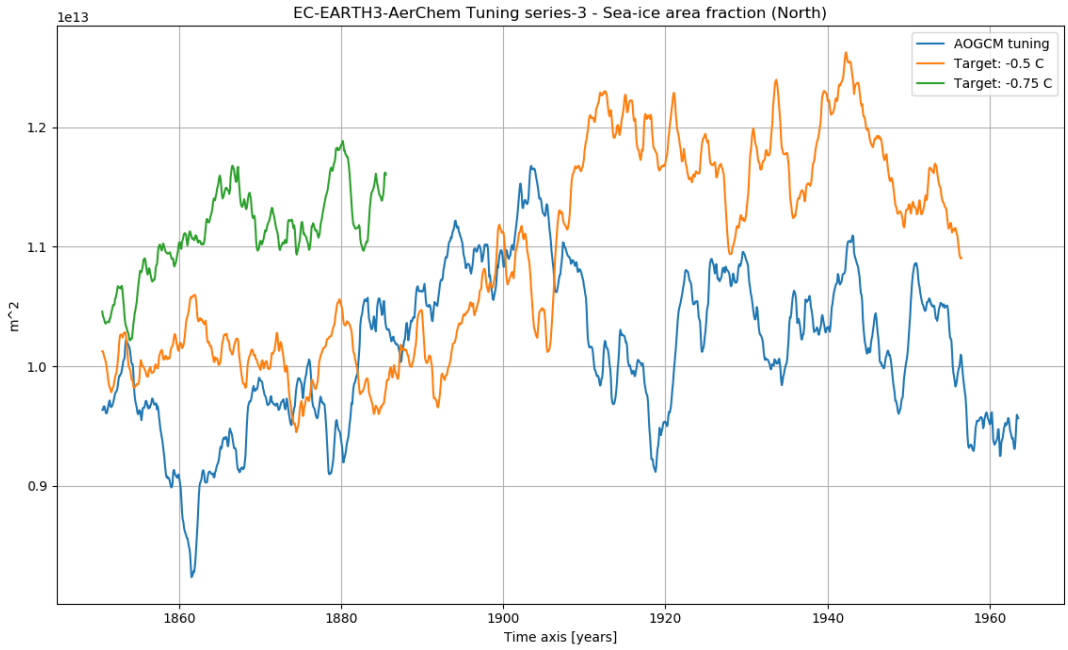
Updated by **Philippe Le Sager** 9 months ago #33

Looking at the experiments run this summer with the improved dust emissions. Same setup as before: one with the GCM tuning, the two other ones with tuning parameters targeting colder mean temperatures. The last two crashed in the the computation of the aerosol refractive index within TM5. All the timeseries are available in the aerchem-tuning-timeseries3-1.pdf file, but here are some of the figures, including the sea surface height. The latter is not increasing as much as found in the previous runs (~~#614-26~~ above) but the increase starts only after 50 years.




EC-EARTH3-AerChem Tuning series-3 - mean_sea_surface_temperature
AOGCM tuning
Target: -0.5 C
Target: -0.75 C
degC
19.3
19.2
19.1
19.0
18.9
18.8
18.7
18.6
1860
1880
1900
1920
1940
1960
Time axis [years]

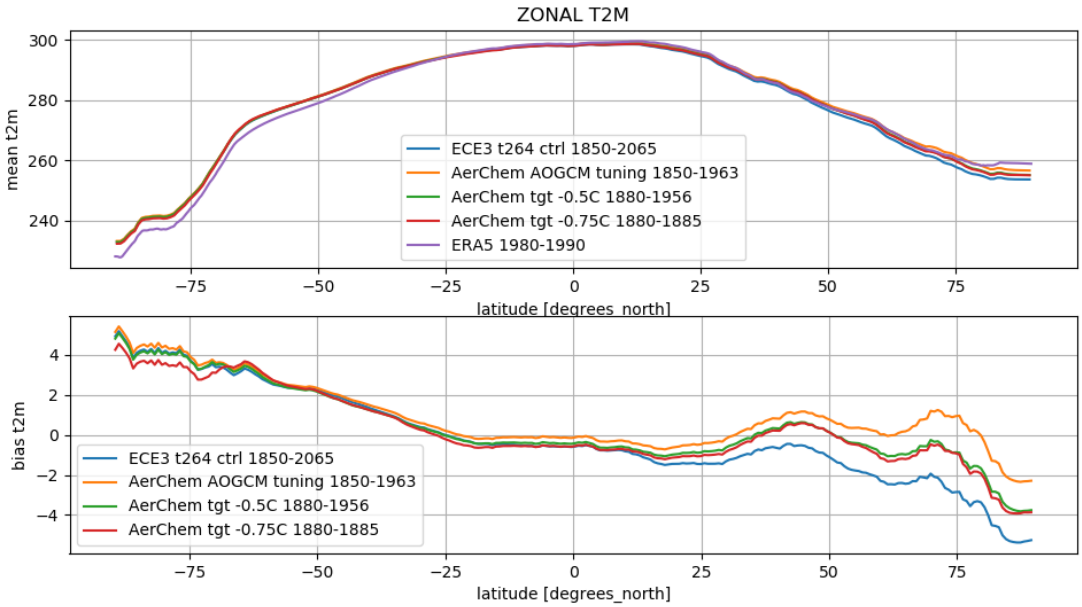

EC-EARTH3-AerChem Tuning series-3 - mean_sea_surface_height_above_geoid
AOGCM tuning
Target: -0.5 C
Target: -0.75 C
m
0.17
0.16
0.15
0.14
0.13
0.12
0.11
1860
1880
1900
1920
1940
1960
Time axis [years]

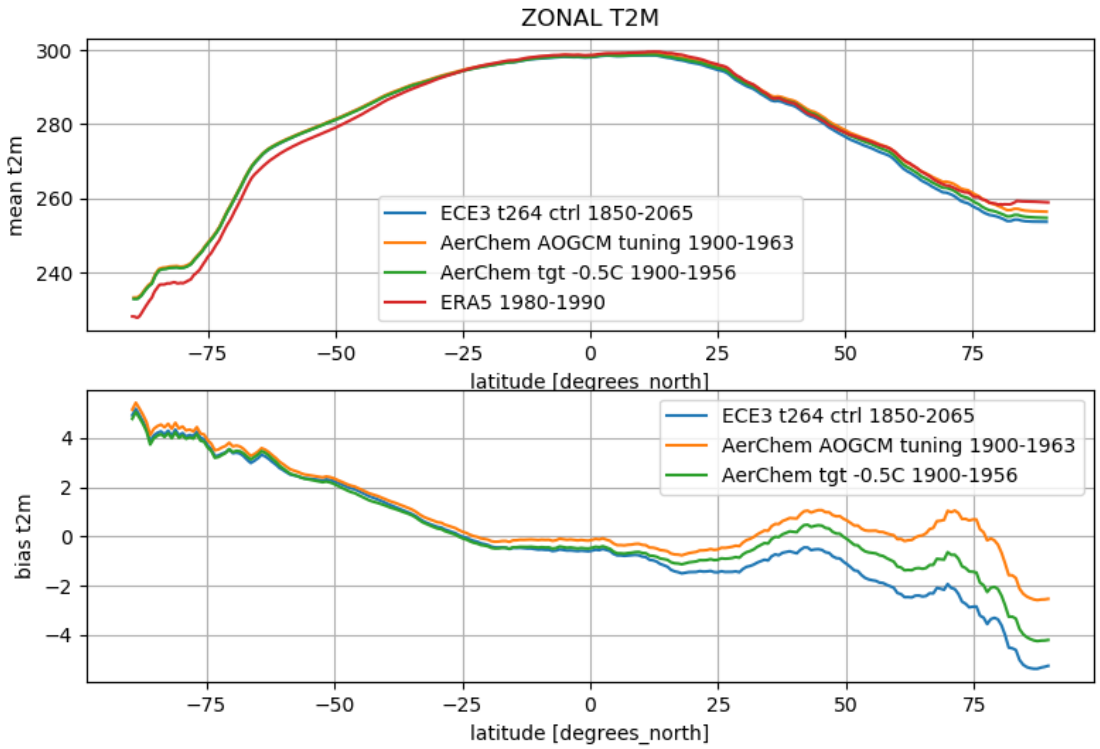


More analysis to come.

Updated by **Philippe Le Sager** 9 months ago #34

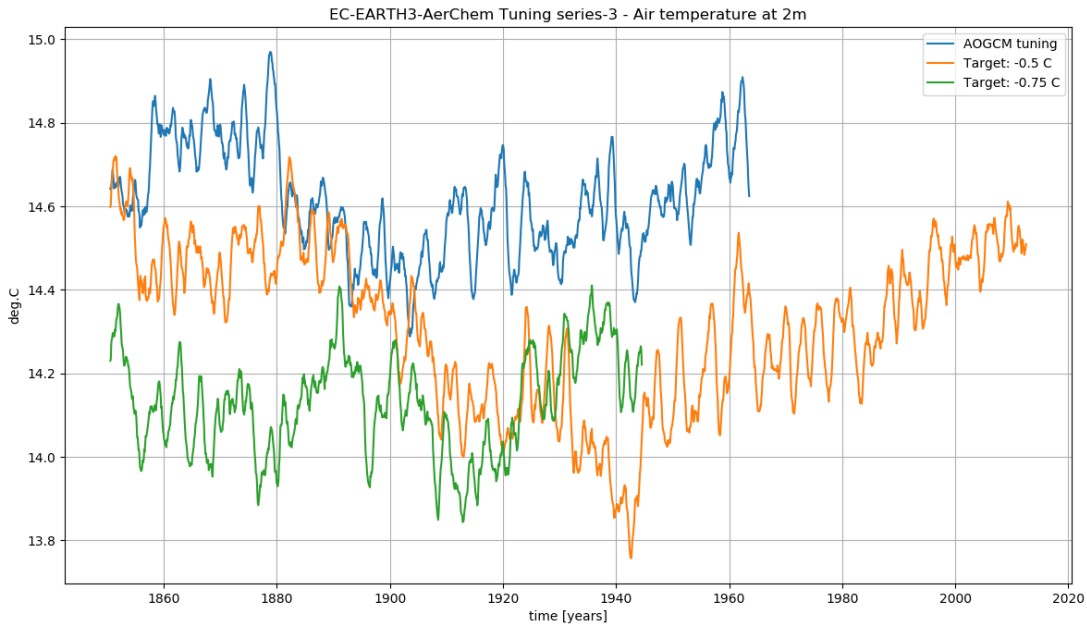
Here are the biases w/r/t ERA5, first considering most of the data, then ignoring the first 50 years:

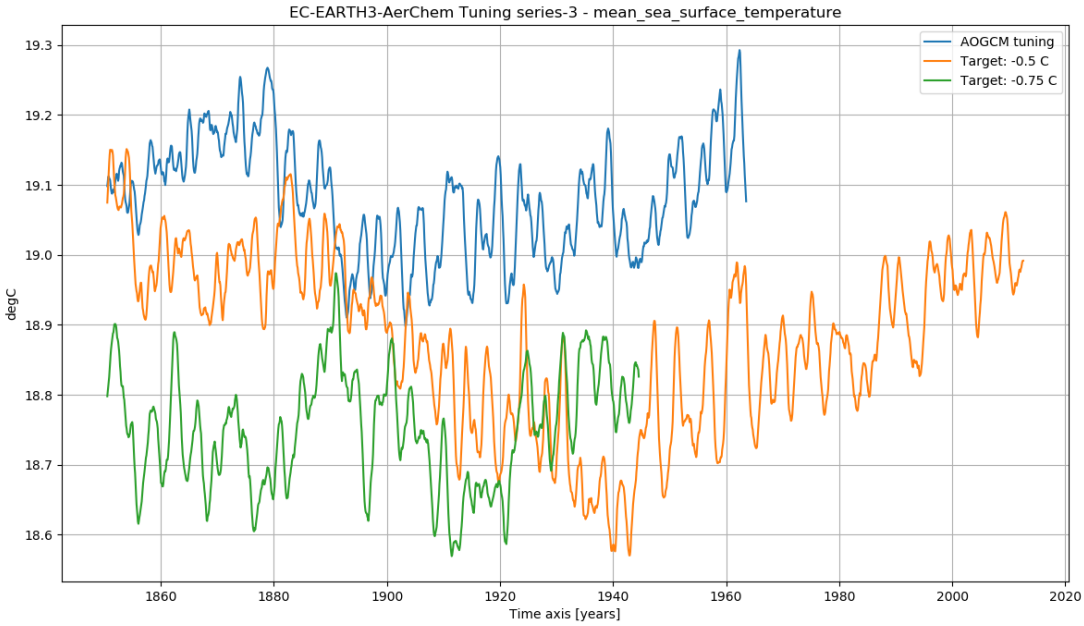


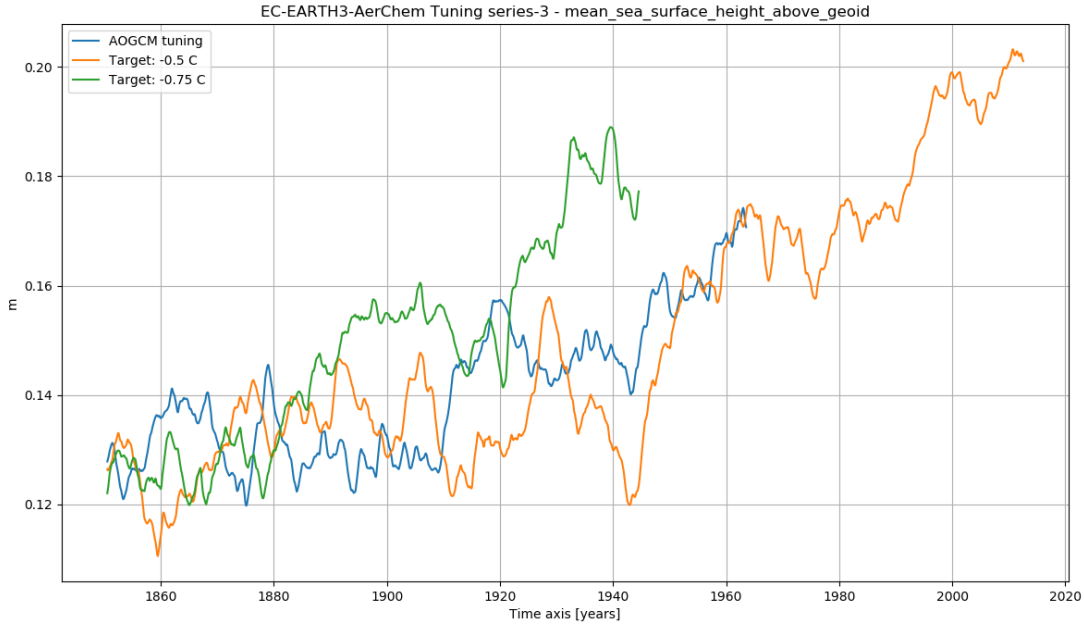


Updated by **Philippe Le Sager** 8 months ago #35

The spinup run aiming at -0.50 (resp. -0.75) degree colder than the original AOGCM have reached 160 years (resp. 94) years. All timeseries of monthly mean global averages can be found in aerchem-tuning-timeseries3-2.pdf. Here are few of them:





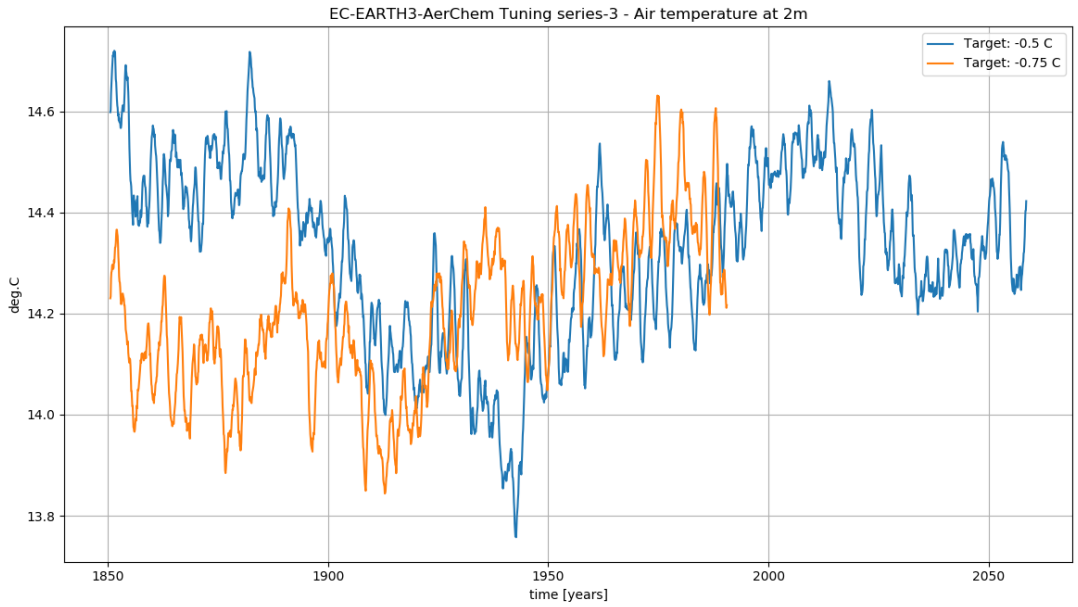


You can see that SSH has increased by 7 cm in the last 72 years (resp. 5 cm in the last 60 years) for -0.50 (resp. -0.75). **The problem raised in ~~#614-26~~ is not gone.** Following Pablo reasoning, it seems to follow the rising temperature to some extent, indicating that the system is not stable yet. I will try to get a full barakuda plots (for some reason the automatic barakuda processing crashed).

The zonal t2m biases (not shown) are very similar to those posted above.

Updated by **Philippe Le Sager** 7 months ago #36

We have more than 200 simulated years for one of the runs. Updated timeseries of monthly mean global averages can be found in aerchem-tuning-timeseries3-3.pdf. Here is TAS:



See #714 for a discussion on SSH, sea salinity and ice fraction, which all show dramatic discontinuity.

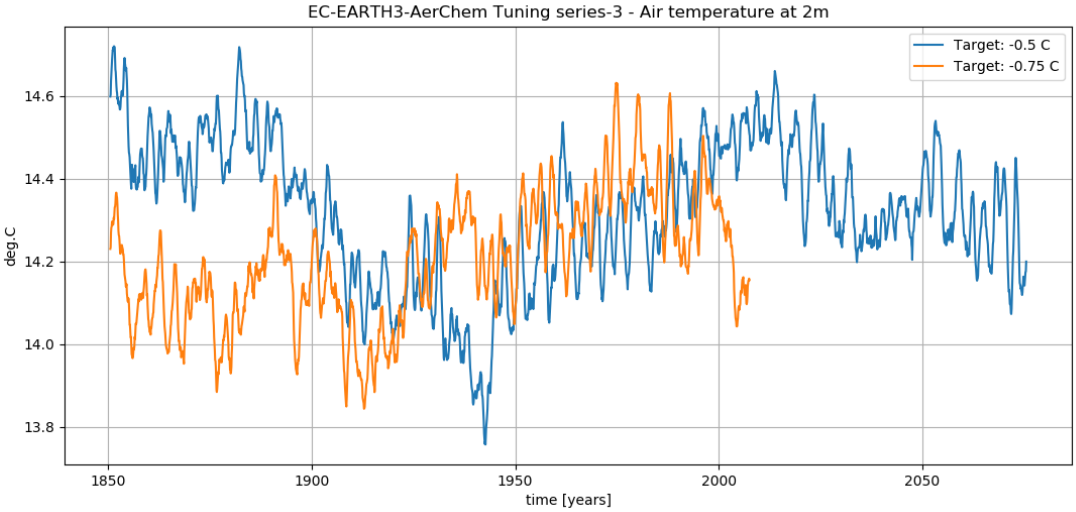
Updated by **Philippe Le Sager** 7 months ago #37

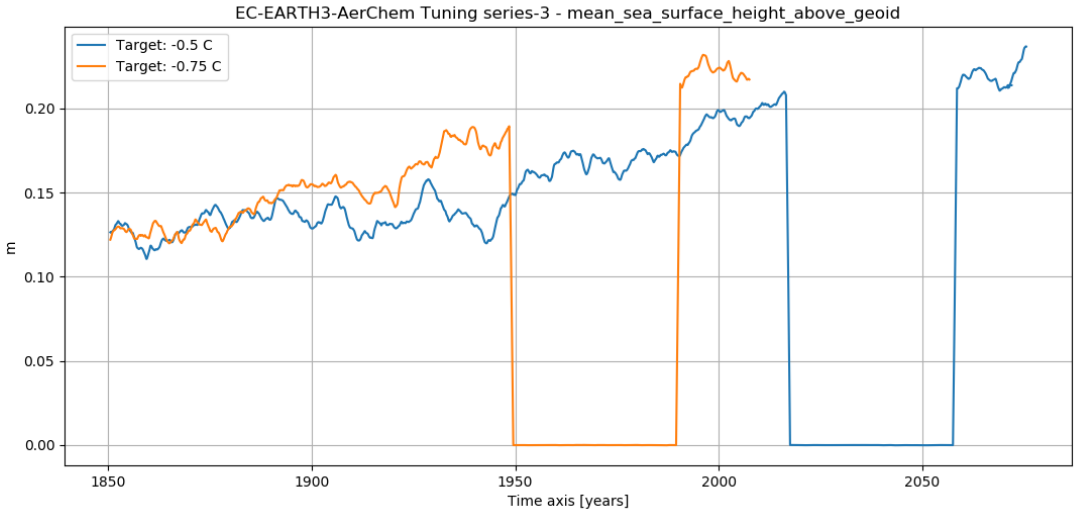
Here is an update for today discussion.

We made a new estimate (reference: ~~#252-53~~) of the runoff correction factor needed to compensate for the non-zero P-E in our runs. For the `baer-050` experiment, PE averages to -0.016888895 mm/day over the last 20 years, and the runoff to 1246.113 10^6 kg/s. That gives us a `corr=0.08002`. For the `caer-075` experiment, PE averages to -0.016757165 mm/day over the last 20 years, and the runoff to 1244.6545 10^6 kg/s. That gives us a `corr=0.07949`.

These factors are very close to the factor used for the AO-GCM (0.07945). Side note: I re-estimated the correction factor over 20 years of the PI-Control of the AO-GCM, and got a 0.0844.

Here are the TAS and SSH with few extra years for the two experiments:





You can see that there is still a small trend in SSH. Eye-balling it, I estimate a rate of 7.5cm/125y = 0.006845 Sv [1]. So I propose to modify the correction factor to remove the drift with [2]: corr_new = 1.07945 - 0.006845/(1246.113e-3) = 1.07395, monitor the runs to check that the drift disappears **and** the system is not too perturbed by this, while I test the updated output/cmorization. Then we can start the PI-control simulations.

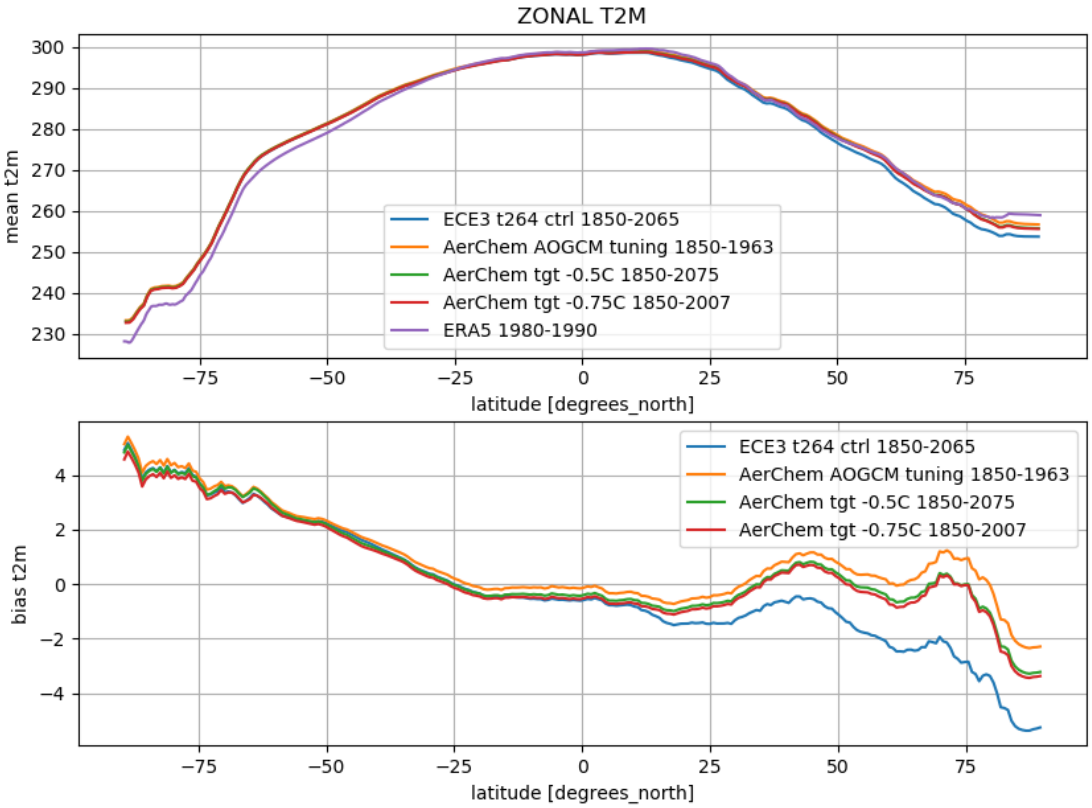
---

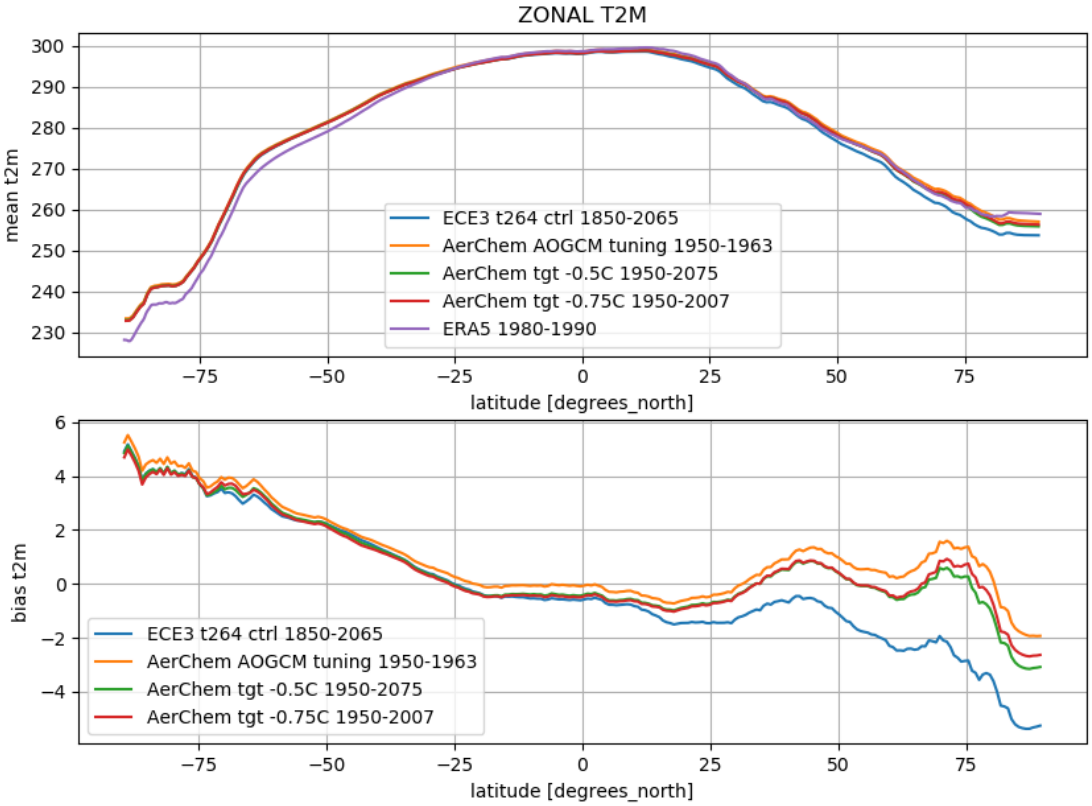
[1] For the record: 0.075[m]*360e12[ocean surface, m^2]/(125*365.25*3600*24 [s])/1e6 = 0.006845 [1e6 m^3/s = Sv]

[2] Since we want to remove the drift, the following should hold: RO * new_factor = RO * old_factor - Drift, and gives the new correction.

Updated by **Philippe Le Sager** 7 months ago #38

To check our targeted temperatures, here are the zonal mean TAS (nominal and biases) over the full runs, and over 1950-latest:





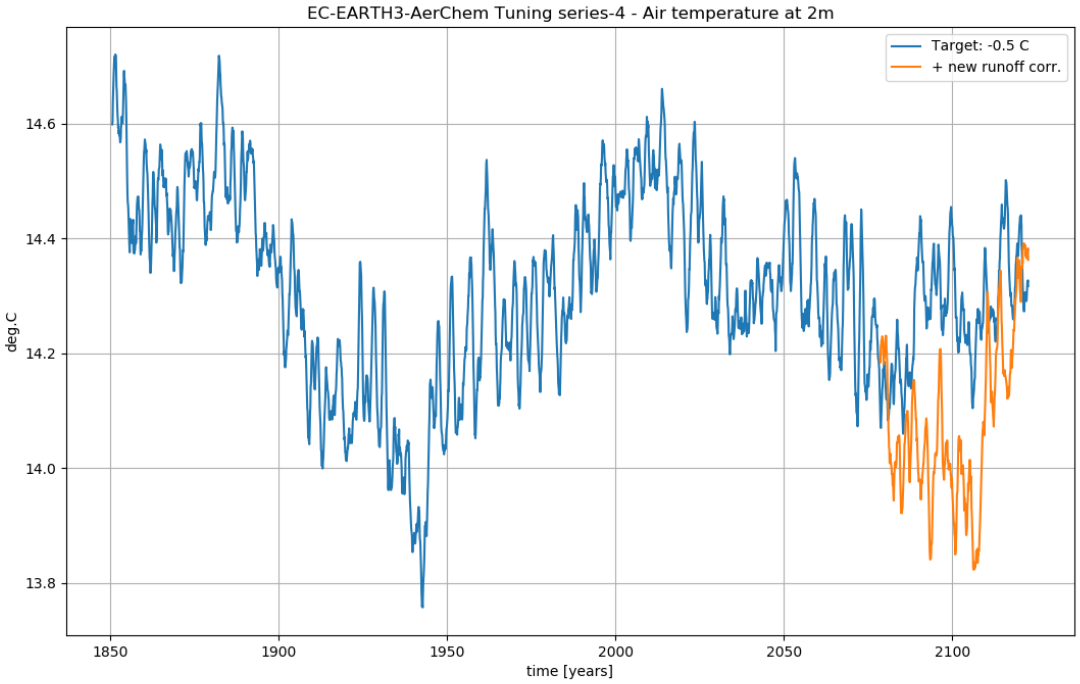
Updated by **Philippe Le Sager** 7 months ago #39

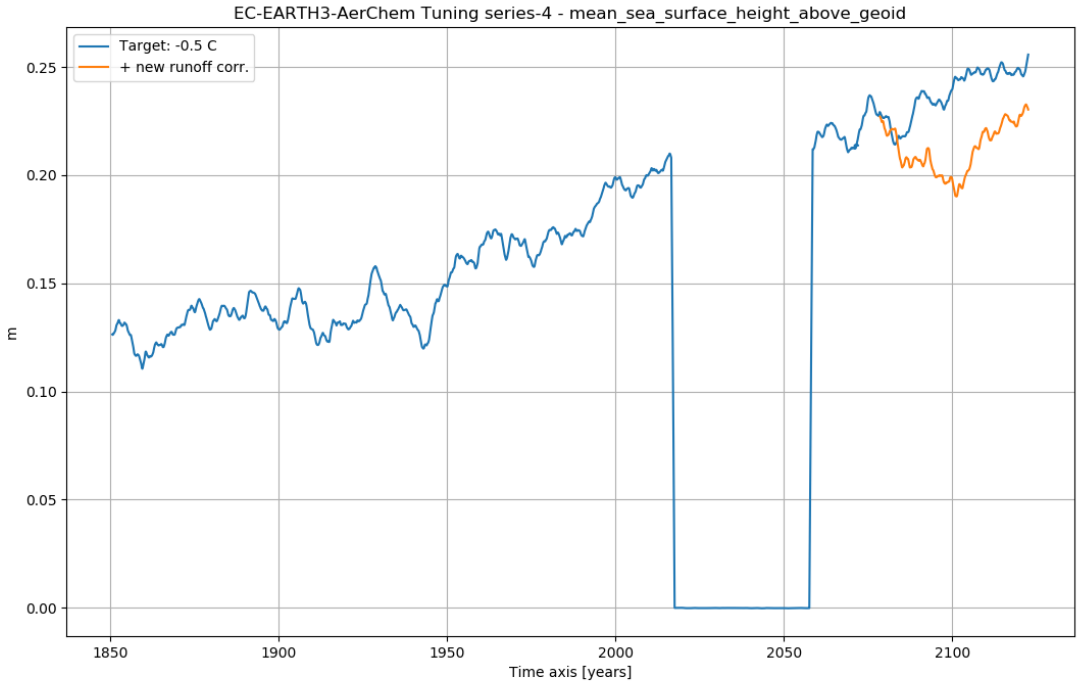
> [...] I propose to modify the correction factor to remove the drift with [2]: corr_new = 1.07945 - 0.006845/(1246.113e-3) = 1.07395, monitor the runs to check that the drift disappears **and** the system is not too perturbed by this, while I test the updated output/cmorization. Then we can start the PI-control simulations.

Proposal has been unanimously accepted during our telecon. New correction factor to be applied today to `baer-050`, which has the longer spinup. The `caer-075` will be stopped and disregarded.

Updated by **Philippe Le Sager** 6 months ago #40

Here are the temperature and nominal SSH with old (blue) and new (orange) runoff correction factors:



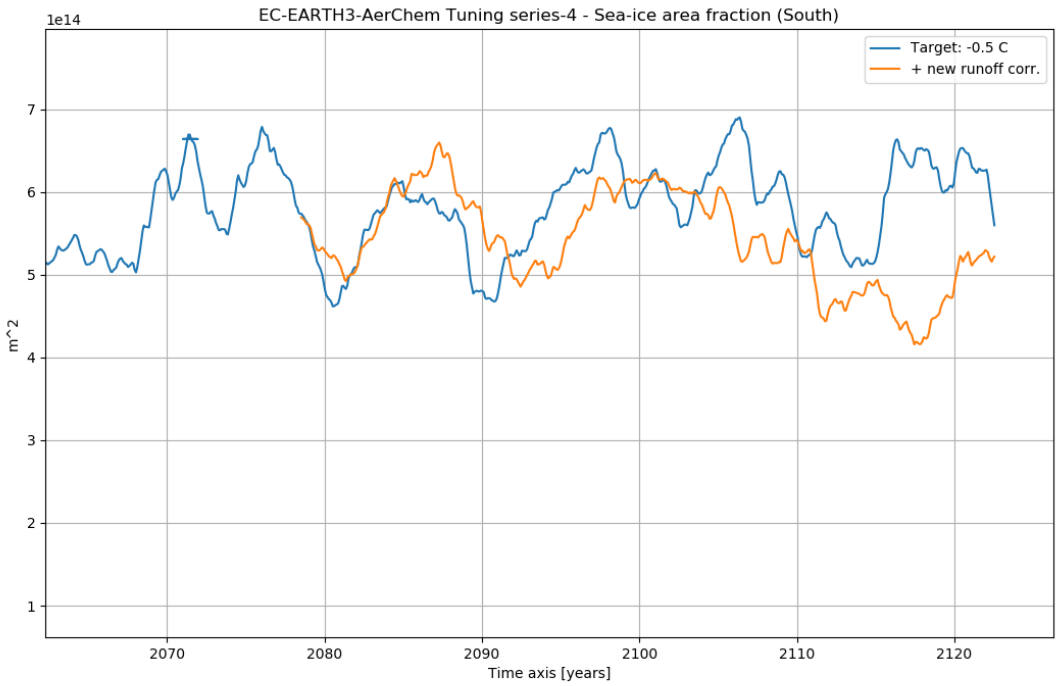


With the old factor, the SSH increases with the same rate as before. With the new one, it looks like the system has readjusted (up to 2000) and then SSH is increasing again, but this also looks quite short to conclude.

All timeseries are in the aerchem-tuning-timeseries-4-1.pdf

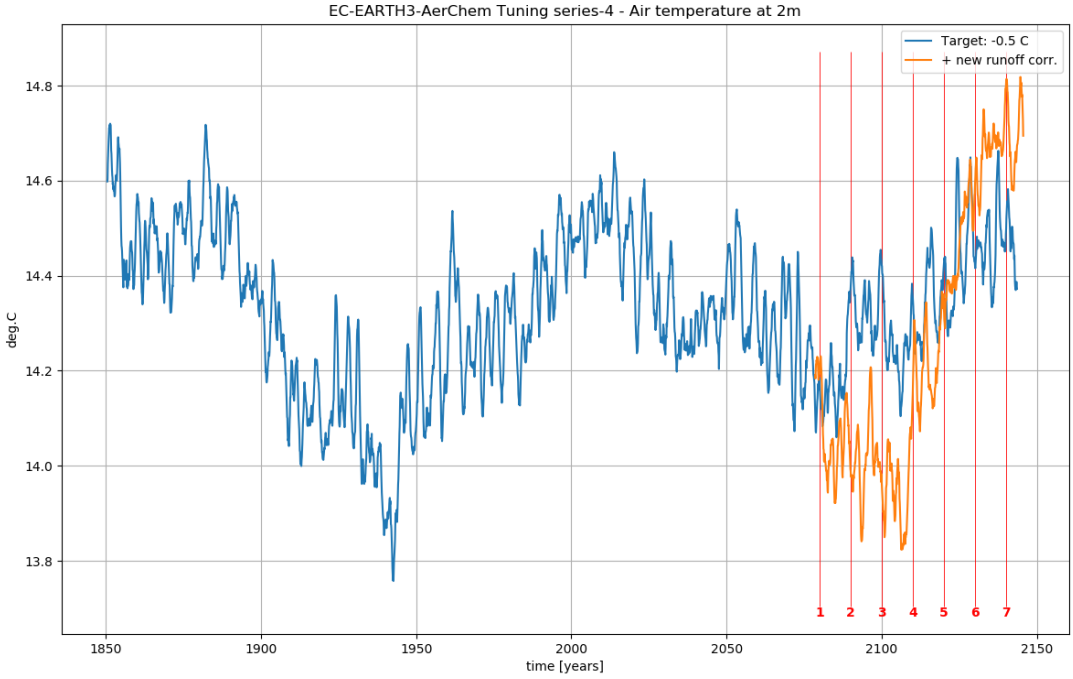
Updated by **Philippe Le Sager** 6 months ago #41

Updated the figures and pdf in the post above with 6 extra years. And here is a better figure for Antartic SI:



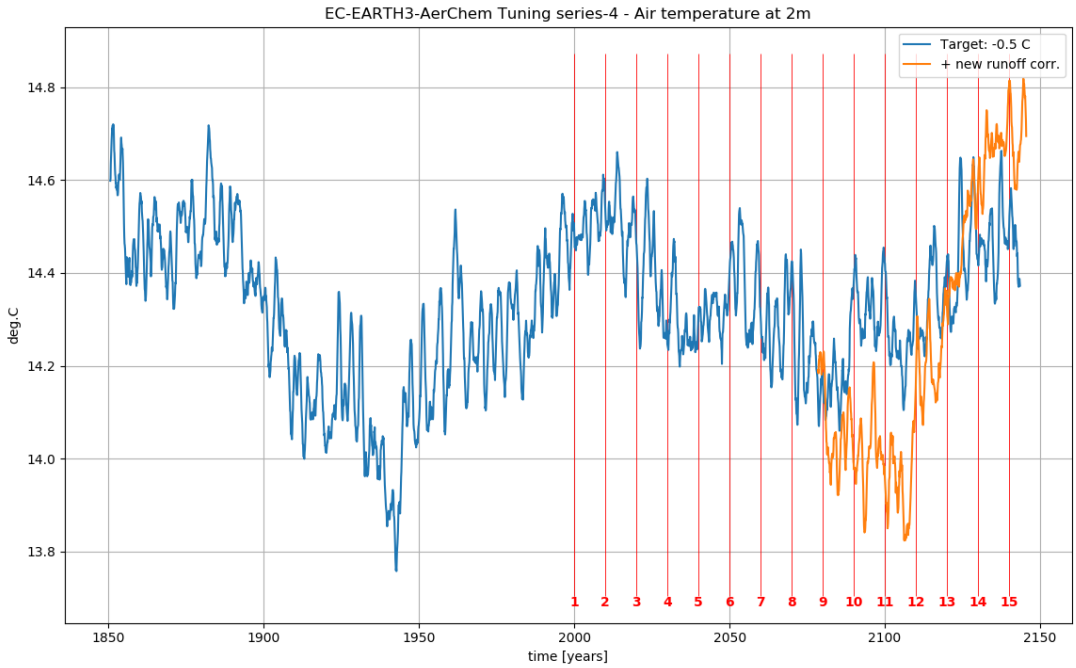
Updated by **Philippe Le Sager** 6 months ago #42

Here are the temperature and nominal SSH with old (blue) and new (orange) runoff correction factors. The vertical red lines indicate the potential candidates for the 1850 initial conditions. The other timeseries can be found in the aerchem-tuning-timeseries-4-2.pdf. We need to decide if we go with the old or the new correction factor, ideally for the release of EC-Earth 3.3.2.



Updated by **Philippe Le Sager** 6 months ago #43

I show here additional initial condition candidates, if we go with the old correction factor. We need to try and sample the 100+ variability for the different members.



Updated by **Twan van Noije** 6 months ago #44

Thanks, Philippe. The re-scaling of the runoff factor has led to a rather strong response of the surface temperature. This response is larger than the amplitude of the slow variations in the other configuration (and if I remember correctly the other tested EC-Earth3-AerChem configurations as well). We don't know if this large swing is related to some adjustment of the system, in which case a longer spinup would be required, or a feature inherent to this configuration. As we need to come to a decision, I would prefer to stay with the old runoff scale factor. The corresponding simulation has been spun up for longer, and we can expect it to be closer to a quasi-stationary state. Deficiencies related to the rising sea surface height are not severe, and of lesser importance to AerChemMIP.

Updated by **Tommi Bergman** 6 months ago #45

I tend to agree. The change in runoff has created a bit more pronounced effect on the system than expected (at least for me). I think we would need to run further for some time to see how it settles and from what we can see right now the model is behaving almost the same as before. As the older run already has a relatively long spin-up, it seems more prudent choice.

Updated by **Twan van Noije** 6 months ago #46

Philippe will start piControl from the red line labelled 13, and share this state with BSC for their 1pctCO2 run.

Philippe will launch the following simulations:

- piControl

- historical, ensemble member #1
- hist-piNTCF, ensemble member #1 (as historical but with NTCF emissions fixed to 1850)
- maybe abrupt-4xCO2

BSC will lauch (possibly before Christmas?):

- 1pctCO2

According to our current plan, the FMI and UHEL members of the historical and hist-piNTCF will be started 20 and 40 years into the piControl. Those states will be shared in January. Then it will also be clear if KNMI was able to run the abrupt-4xCO2 or if FMI will do it.

Updated by **Philippe Le Sager** 6 months ago #47

Initial conditions for the first round of simulations have been stored on ECFS at:

```
ec:/nm6/EC-EARTH/ECEARTH3.2b/INPUT/member-one-ICs-AerChem.tar.gz
```

A project branch, based on EC-Earth 3.3.2, has been created. Its `runtime/classic` accounts for these initial conditions, and the ppt control output files of five experiments (see r7463) have been edited to agree with #736-7. The branch is:

```
^/ecearth3/branches/projects/3.3.2-aerchemmip
```

See README in the top directory of that branch for basic but very important instructions (r7466).

Updated by **Klaus Wyser** 6 months ago #48

Congratulations to the end of the tuning of EC_Earth3-AerChem and start of DECK and hoistorical experiments! (I know how hard it is to get there.)

Just for curiosity: do you happen to have 2-d plots from the tuning? I am wondering about the SO bias, was it reduced when you decided to aim at a lower global mean temperature? Or was the temperature (SST) lower everywhere?

Updated by **Philippe Le Sager** 6 months ago #49

I do not have surface plots readily available but ~~#614-38~~ gives a pretty good idea about SST (which follows TAS) behavior. The zonal means show no difference in the SH, the tuning mainly affects the NH. First order of things.

Updated by **Twan van Noije** 6 months ago #50

Update to note ~~#614-46~~ above.

Philippe has started the following simulations (see EC-Earth3-AerChem tables in https://docs.google.com/spreadsheets/d/1Z71IdM08yQ9Lqm0L3gwIf9PnNvV2sgahIwI94sB3YBA/edit#gid=0):

- piControl
- historical, ensemble member #1
- hist-piNTCF, ensemble member #1 (as historical but with NTCF emissions fixed to 1850)
- abrupt-4xCO2
- 1pctCO2

The 1pctCO2 simulation is running at ECMWF, the rest at the KNMI machine.

Updated by **Philippe Le Sager** 5 months ago #51

I propose to limit this issue to the spinup and tuning of EC-Earth3-AerChem, since it is quite long already. I've started a new issue to monitor the DECK runs, namely ~~#752~~. I will keep this issue open until I produced the extra member initial conditions.

Updated by **Philippe Le Sager** 5 months ago #52

Additional initial conditions for historical members 2-to-4 have been produced from the piControl run. They correspond to 1870-01-01, 1890-01-01, and 1910-01-01. They should be ready to use with the *branches/projects/3.3.2-aerchemmip* branch: just set `prev_exp_name=pict` and `prev_exp_date` to one of these dates (in YYYYMMDD format). The new ICs are available on ECFS at:

```
ec:/nm6/EC-EARTH/ECEARTH3.2b/INPUT/AerChemMIP-piControl-ICs-2-to-4.tar.gz
```

We just need to decide which date/member should be used by each participating institute.

Updated by **Jukka-Pekka Keskinen** 5 months ago #53

Philippe Le Sager wrote:

> [...]We just need to decide which date/member should be used by each participating institute.

I think Risto communicated this already elsewhere but we FMI and UHel agreed that UHel shall do member 2 and FMI member 3. BSC had earlier stated their interest in member 4.

Updated by **Philippe Le Sager** 5 months ago #54

Since the exta members have been distributed, I'm closing the issue. It is referenced in the AerChem configuration and output setup for CMIP6 wiki page.

General input #785

Additional spinup with EC-Earth3-AerChem 3.3.2.1

Added by **Philippe Le Sager** 3 months ago. Updated about 1 month ago.

Status:	RESOLVED	Start date:	17 Mar 2020
Priority:	High	Due date:	
Assignee:	-	% Done:	100%
Category:	-	Estimated time:	
Target version:	-		

Description

Following the stratospheric bug fix, I've started a new spinup/PI-control run. The goal of this issue is (1) to decide if we need to tune the model further (time allowing), and if not, (2) to decide when we have enough spinup and can start the DECK runs. The aerchem-pi-ctls-v1.pdf compares timeseries of the old buggy PI-control and the new spinup. At this stage (~14 years run only), the new model is about colder by about 0.3 degree (from `tas`). If you look at `sst`, you see a trend toward a colder state, meaning that the ocean is not at equilibrium yet.

aerchem-pi-ctls-v1.pdf (345 KB)	Philippe Le Sager, 27 Mar 2020 08:14
aerchem-t2m-xtra-spinup-after-strataero-bugfix.png (136 KB)	Philippe Le Sager, 30 Mar 2020 10:09
aerchem-zonal-t2m-biases-xtra-spinup-after-strataero-bugfix.png (96.8 KB)	Philippe Le Sager, 30 Mar 2020 10:09
aerchem-strataerofixed-spinup.pdf (385 KB)	Philippe Le Sager, 30 Mar 2020 10:09
spin-mean-tas.png (56.4 KB)	Philippe Le Sager, 30 Mar 2020 10:09
aerchem-zonal-t2m-biases-xtra-spinup-after-strataero-bugfix-2.png (88.5 KB)	Philippe Le Sager, 06 Apr 2020 15:42
aerchem-strataerofixed-spinup.pdf (508 KB)	Philippe Le Sager, 06 Apr 2020 15:42
aerchem-t2m-xtra-spinup-after-strataero-bugfix.png (152 KB)	Philippe Le Sager, 06 Apr 2020 15:42
aerchem-t2m-xtra-spinup-after-strataero-bugfix-LTS.png (93.1 KB)	Philippe Le Sager, 06 Apr 2020 15:42
aerchem-t2m-xtra-spinup-after-strataero-bugfix-2.png (150 KB)	Philippe Le Sager, 14 Apr 2020 09:41
aerchem-strataerofixed-spinup-100y.pdf (484 KB)	Philippe Le Sager, 14 Apr 2020 09:41

aerchem-strataerofixed-spinup-130y-yearly.pdf (154 KB)	Philippe Le Sager, 24 Apr 2020 10:16
aerchem-t2m-xtra-spinup-after-strataero-bugfix-130y.png (193 KB)	Philippe Le Sager, 24 Apr 2020 10:16
aerchem-strataerofixed-spinup-154y-yearly10.pdf (149 KB)	Philippe Le Sager, 08 May 2020 09:14
tas_154y-monthly.png (240 KB)	Philippe Le Sager, 08 May 2020 09:14
ece3-aerchem-spinup.pdf (2.89 MB)	Philippe Le Sager, 08 May 2020 09:14

Subtasks

Related issues

Show details

History

All Notes Changes

Updated by **Philippe Le Sager** 3 months ago #2

Updated the pdf with further years, and added the AOGCM (historical run for now, until I got my hands on the PI control).

Updated by **Philippe Le Sager** 3 months ago #4

Updated the global timeseries with now almost 50 years of data. Keep in mind that the AOGCM is still the historical run, and you can see the effect of volcanic eruption (sharp drop in tas and TOA/sfc fluxes) in 1884. Overall the model is on par with the AOGCM run (see MOC e.g.), and seems to have stabilized: SST, and more importantly 3D ocean temperature, looks flat now.

Updated by **Twan van Noije** 3 months ago #5

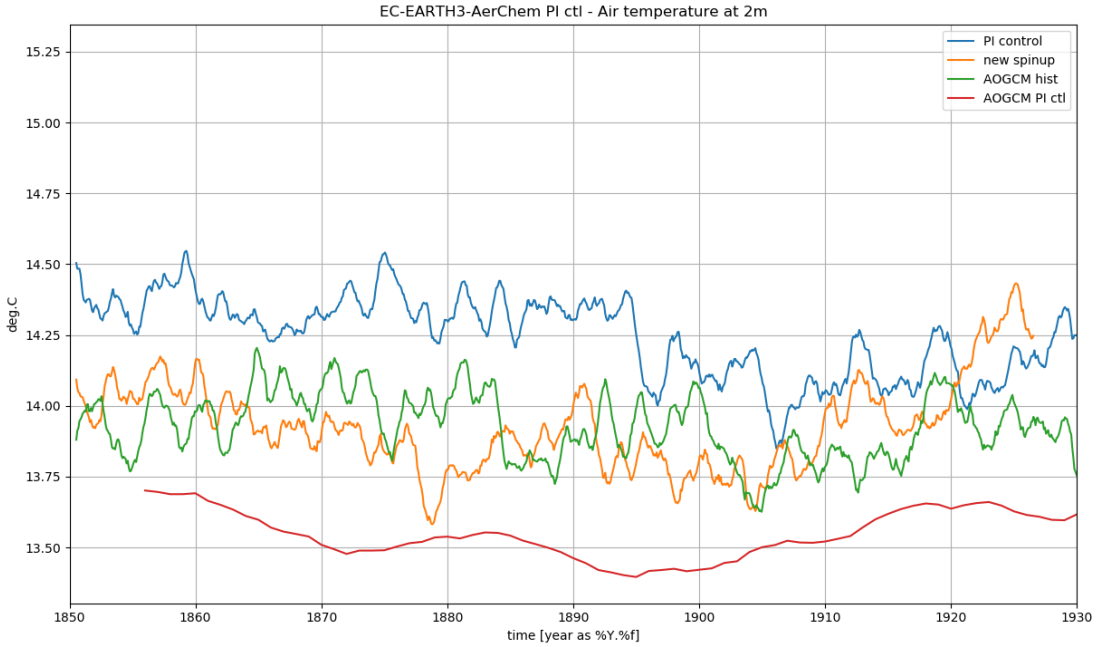
Would it be useful to make the same zonal mean tas and bias plots as shown in ~~#614~~?

Updated by **Philippe Le Sager** 3 months ago #6

For a comparison with the AOGCM control, see #598-45.

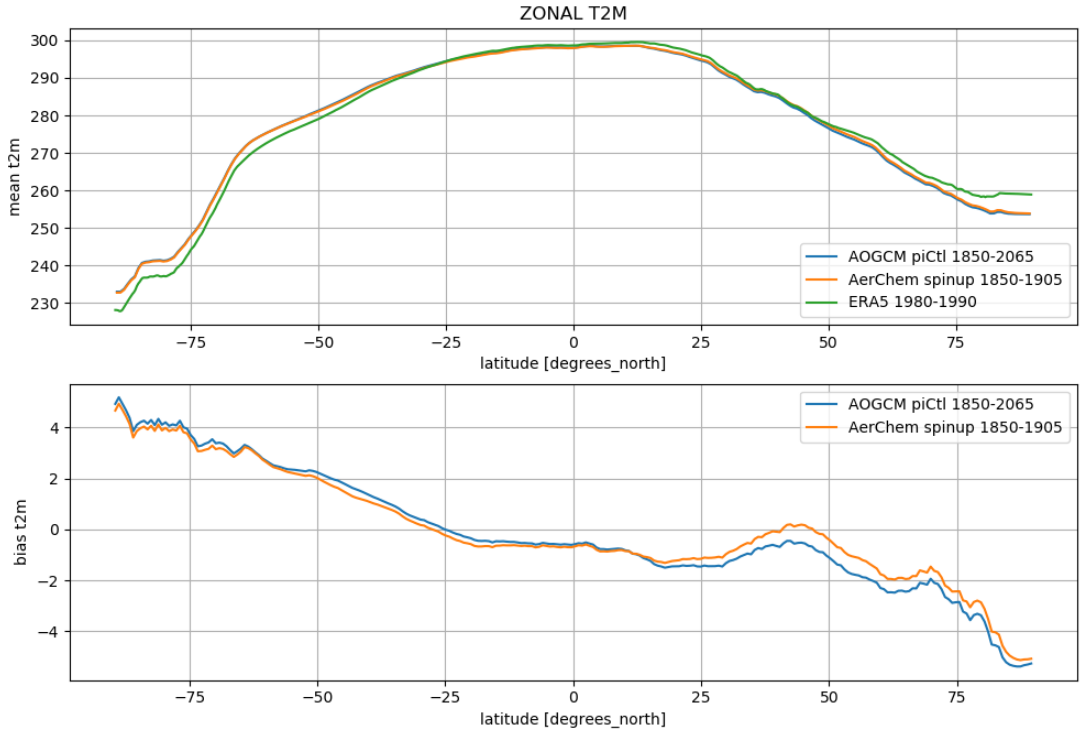
Updated by **Philippe Le Sager** 2 months ago #7

As promised last Friday during our video-conf, here is an update at 50+ years of spinup for us to decide if we can start the DECK experiment or not. The global timeseries are in the aerchem-strataerofixed-spinup.pdf, where you will see that `t2m` is slightly decreasing again:



The trend is also visible in SST and sea salinity.

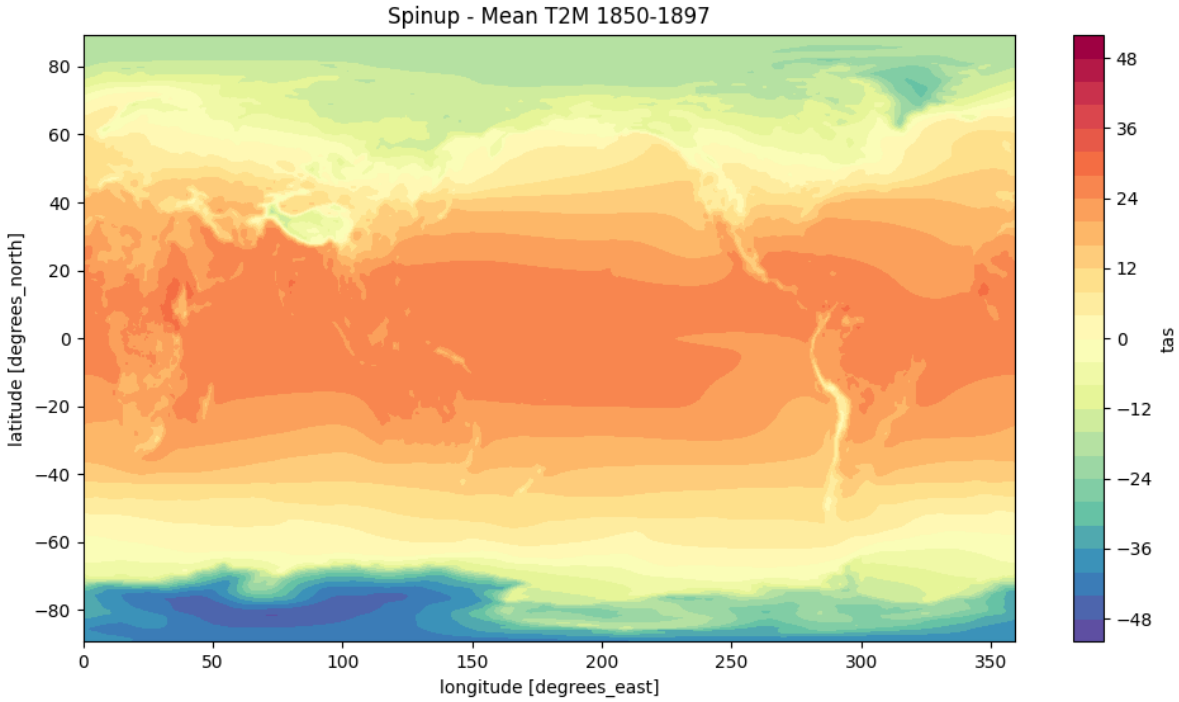
And here is the `t2m` bias with respect to ERA5 for the AOGCM control run and our current spinup:



where you see the AerChem configuration is as bias as the AOGCM (top), but still warmer in the northern hemisphere (bottom). Something we have always wanted.

But With only 50 years, it is impossible to say if we are going toward a colder and more stable state, or we are just in between cold/warm states like the AOGCM control shown in #598-45, where `t2m` oscillates between 13.4 and 14.2 C. It is tempting to think we are in a similar situation as the AOGCM, but I think more years are needed to conclude, particularly if we have to disregard the first 10-20 years where the system adapt to the new code. I think we should not rush, and wait for 10-20 model years, which will be available by end of the week. Opinions?

As an extra, here is the average `t2m`:



Updated by **Twan van Noije** 2 months ago #8

I agree, we have to continue the spinup a bit longer. The 3-D mean sea water potential temperature seems to have stabilised quite well, but I am not sure if that's a sufficient criterion.

It indeed seems a good sign that the model is still a bit warmer in the NH than the AOGCM piControl. However, this is partly because the presented zonal mean is calculated including also the initial period where the model is still cooling, right? Also, the OAGCM shows a positive bias compared to ERA5 in most of the SH, also when the comparison is done using the actual present-day (1980-2010) data (see e.g. Ralf's presentation). Thus, the fact that the SH is somewhat colder in the new spinup is not bad either.

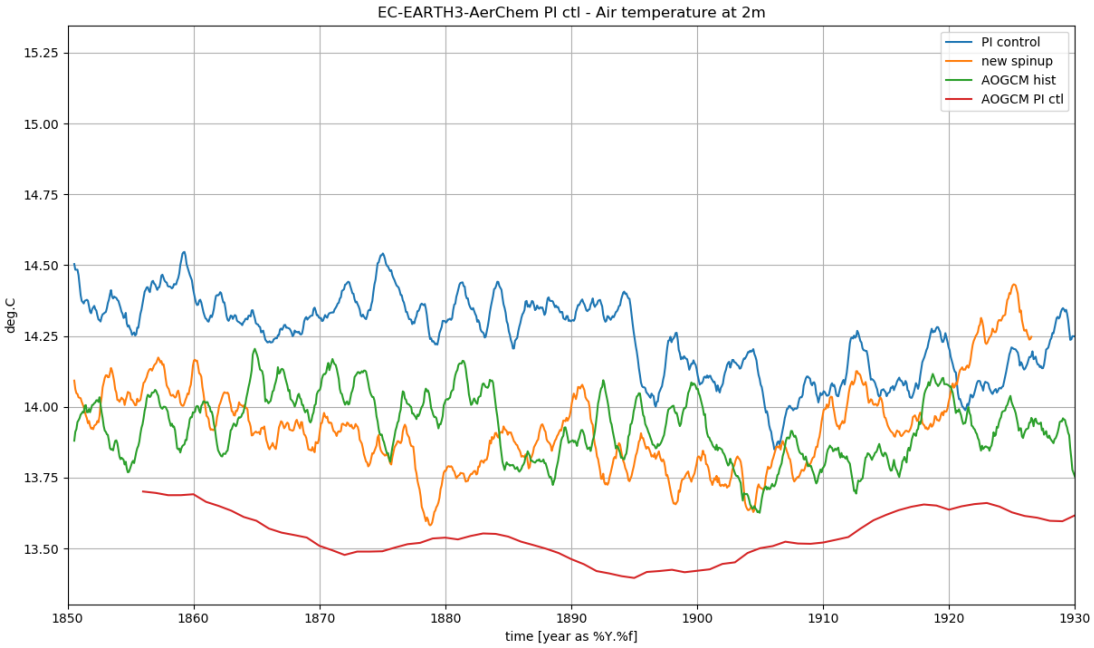
Updated by **Philippe Le Sager** 2 months ago #9

Update 2020-05-08: for future visitors wondering "why PI control and hist in AOGCM are so different, in the sense that it does not look like hist is branched off from PIC. The starting point of Hist is very different from any point in the PIC". HIST was started from 2260, while the pictl started on 2160 (100 years earlier) and here it is shifted to 1850. With the large 200 year swing in these runs, a 100y difference in time shift gives the wrong impression.

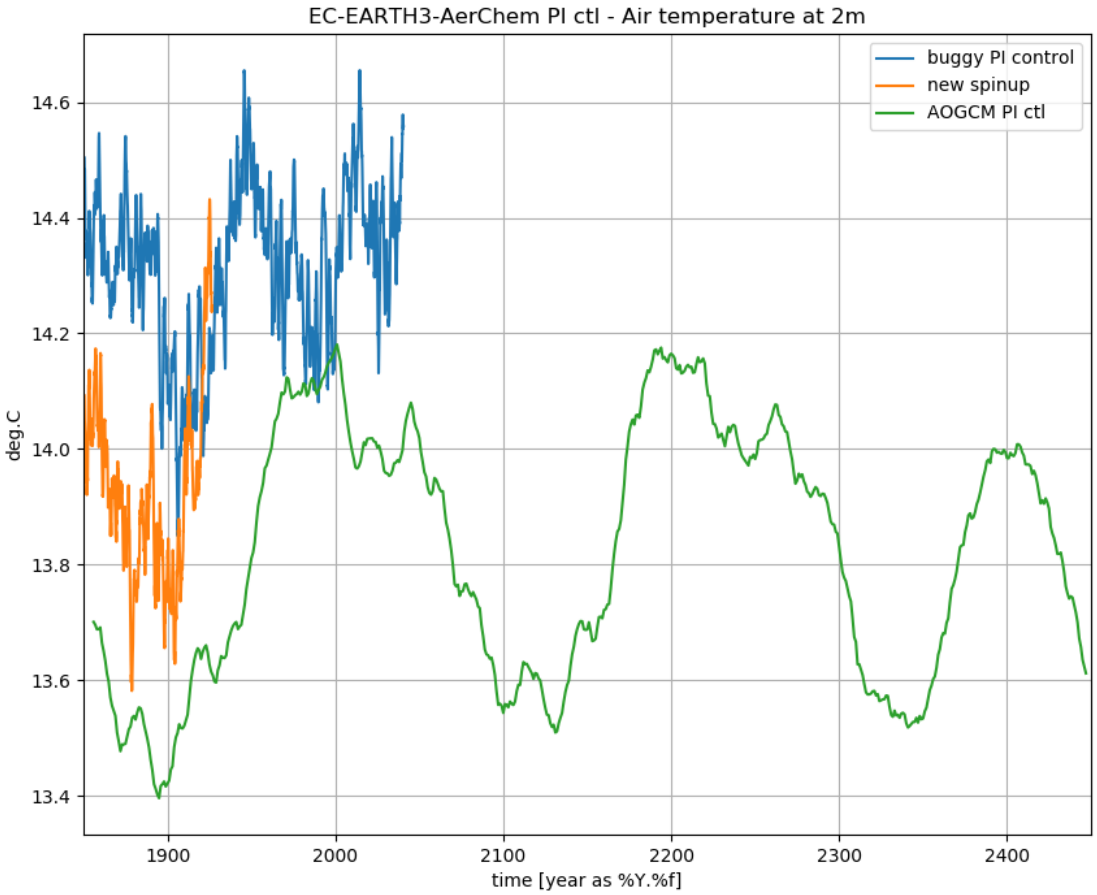
And for those wondering if the variability in the chemistry runs, which is much larger than in AOGCM, is realistic: this was due to the yearly average, which was further smoothed out with a 12-year moving average (this was applied automatically in my compare script, which assumes monthly data).

Original post

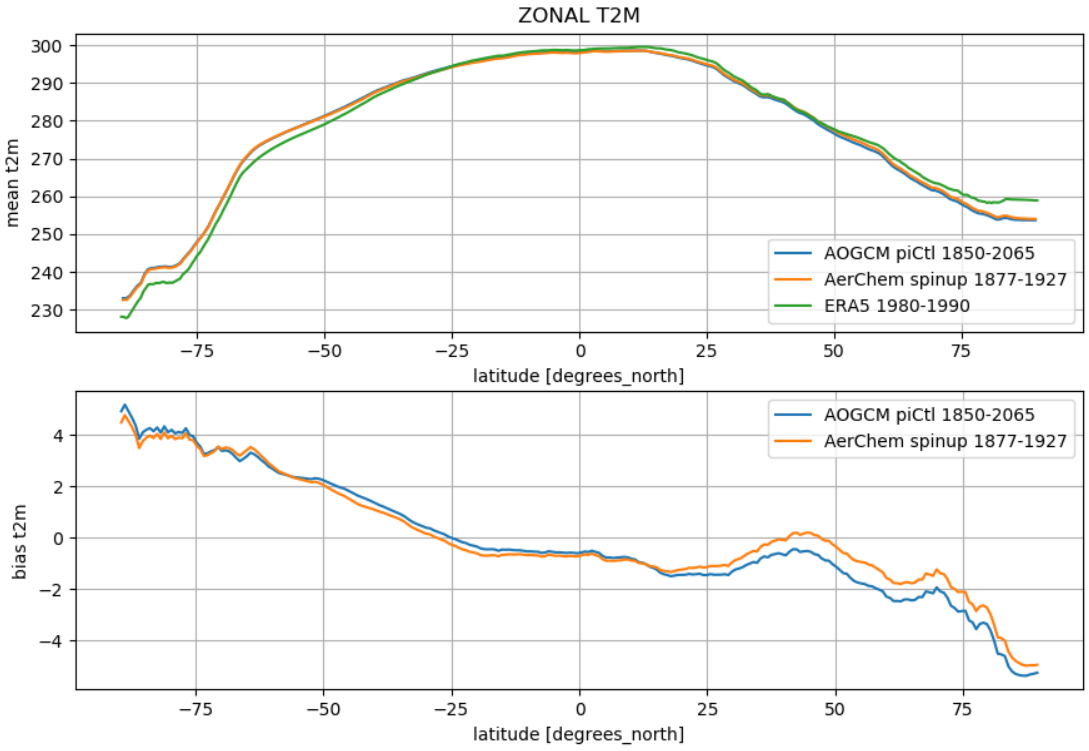
Here's an update at 75 years into the spin up. Time series (aerchem-strataerofixed-spinup.pdf) now include the yearly mean of the AOGCM PI control. This is far from steady. There is an impressive increase in T2M of 0.5 degree in the last 20 years:



To have an overview with the large swing of the GCM PI control:



The zonal mean does not change much (I've removed the first 25 years or so), a bit warmer in 50-75 South:



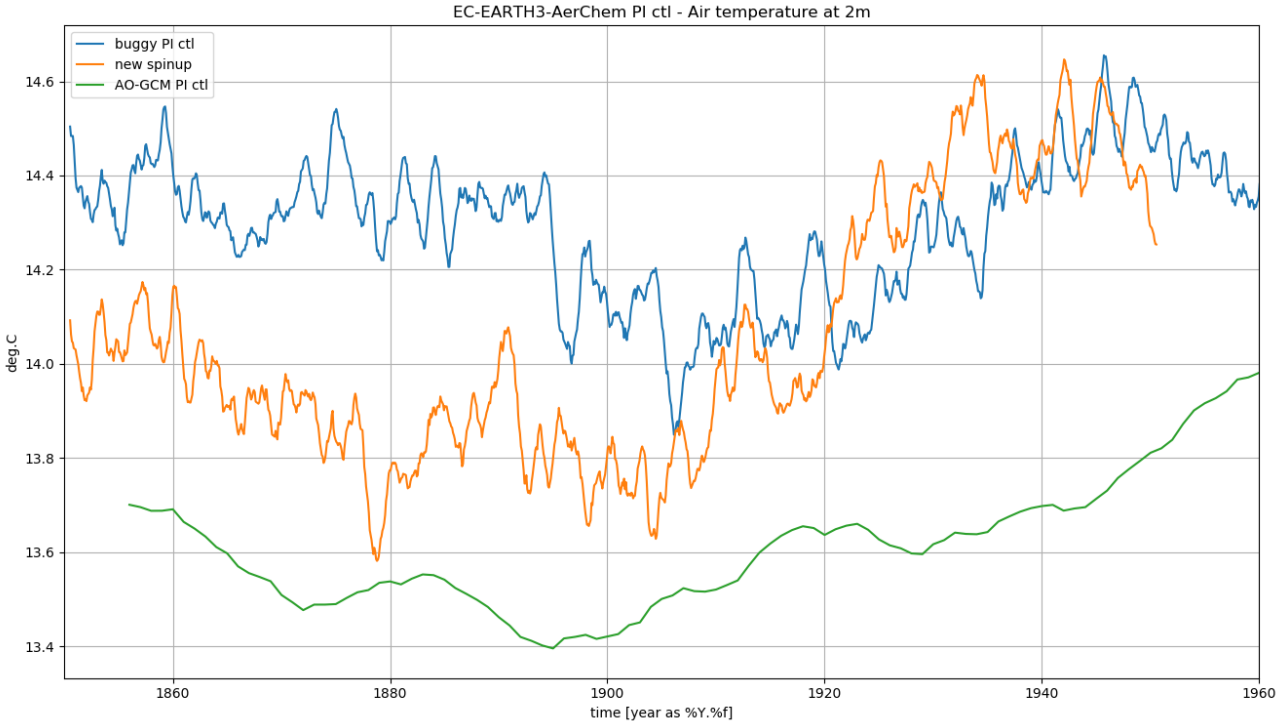
Updated by **Tommi Bergman** 2 months ago #10

I agree it seems that the run is not stable yet.

When looking at other plots, TOA and SURF solar radiation is increasing (~1wm-2 at TOA in last 20 years, <0.5Wm-2 on the surface in last 10 y), perhaps partly in response to NH sea ice having a downward trend. Furthermore, MOC has a peak right at the moment. It is unclear what triggers this, but this might mean we will also have the swinging between two states like AOGCM as your figure suggests.

Updated by **Philippe Le Sager** about 2 months ago #11

Update at 100 year. All timeseries are in the aerchem-strataerofixed-spinup-100y.pdf. Here's t2m:



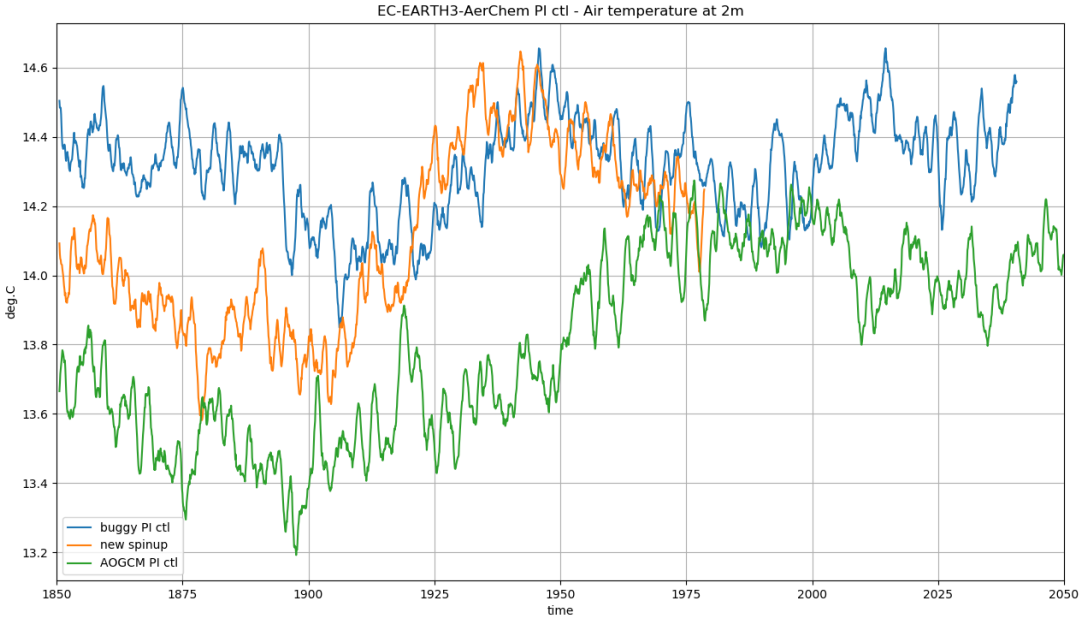
Like the t2m increase, decrease of evaporation/north sea-ice, increase of precipitation/SST/MOC have all stopped (or at least reverted direction) and are at the level of the previous PI control. At this point, it is reasonable to assume that the spinup is no more diverging toward another state. It seems to have stabilized or/and to be an oscillating system, maybe not with as much amplitude as the AO-GCM PI control. We'll have to see if this spinup will go back to 1880-1900 the levels. But that should not prevent us to start the deck experiments.

Updated by **Twan van Noije** about 2 months ago #12

OK.

Updated by **Philippe Le Sager** about 2 months ago #13

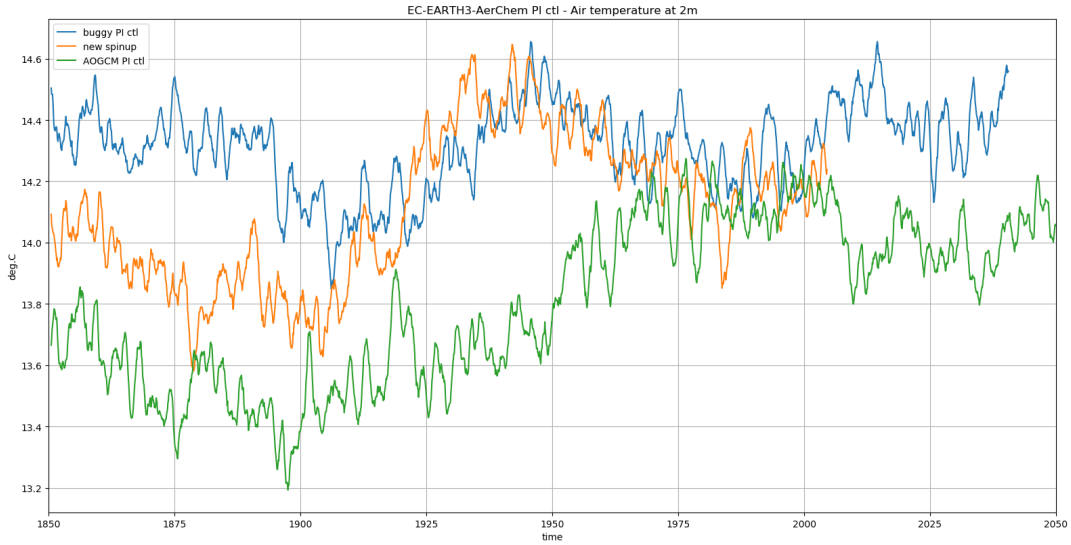
Here's another update. I choose to plot yearly averages instead of the usual 12-month moving averages of monthly mean. This makes the plots slightly more readable. I show 200 years of data to get an idea of the variability we have in the AOGCM control run. All plots in the aerchem-strataerofixed-spinup-130y-yearly.pdf, and here's `t2m`:



Updated by **Philippe Le Sager** about 1 month ago #14

I've prepared an overview of the spinup after 150 years (ece3-aerchem-spinup.pdf). It was presented at KNMI to get more feedback from colleagues, particularly from an ocean point of view. The conclusion is that any start date between 1975 and 2000 is good to start the DECK runs. I picked up 2000 and started a first set of runs, which are documented in #812.

For the record (the spinup is stopped due to lack of resources) here the latest `t2m`:



The aerchem-strataerofixed-spinup-154y-yearly10.pdf provides all others variables (but in 10-year moving averages of yearly averages this time).

General input #812

Monitoring EC-Earth3-AerChem CMIP6 DECK runs

Added by **Philippe Le Sager** about 1 month ago. Updated about 19 hours ago.

Status:	INVESTIGATION	Start date:	08 May 2020
Priority:	Low	Due date:	
Assignee:	-	% Done:	20%
Category:	-	Estimated time:	
Target version:	-		

Description

This tracker is used to monitor the CMIP6 DECK runs started with the EC-Earth-3.3.2.1 following the spinup done in #785.

aerchem-deck-cmip6.pdf (195 KB)	Philippe Le Sager, 08 May 2020 09:10
aerchem-deck-cmip6.pdf (346 KB)	Philippe Le Sager, 15 May 2020 13:49
aerchem-deck-cmip6.pdf (583 KB)	Philippe Le Sager, 25 May 2020 14:02
aerchem-deck-cmip6.pdf (913 KB)	Philippe Le Sager, 11 Jun 2020 11:56

Subtasks

Related issues

Show details

History

All Notes Changes

Updated by **Philippe Le Sager** about 1 month ago #1

The global timeseries (12-month moving averages of monthly means) after a week: aerchem-deck-cmip6.pdf

Updated by **Philippe Le Sager** about 1 month ago #2

As mentioned by Declan, there is a volcano around 1861 - and its effect on top solar radiation is correct. Not as strong as the 1883 Krakatoa eruption, but worth remembering to test future models.

Updated by **Philippe Le Sager** about 1 month ago #3

Initial conditions for member 2 (20 years into the control run) are ready to be used. You can get them from ECFS:

```
ec:/nm6/EC-EARTH/ECEARTH3.2b/INPUT/IC-aerchemMIP-xtra-members.tar.gz
```

`branch_time_in_parent` in the JSON file should be 7305 (as corrected in #736-11).

Updated by **Jukka-Pekka Keskinen** 30 days ago #4

Excellent! The second historical member is in the queue now.

Updated by **Philippe Le Sager** 28 days ago #5

Good! Here's another one: ICs for third member (based on 1890 PI-control) have been added to the `ec:/nm6/EC-EARTH/ECEARTH3.2b/INPUT/IC-aerchemMIP-xtra-members.tar.gz` archive. I've also updated the aerchem-deck-cmip6.pdf.

Updated by **Philippe Le Sager** 18 days ago #6

ICs for 4th member are in. I've collected all four members ICs into:

```
ec:/nm6/EC-EARTH/ECEARTH3.2b/INPUT/IC-aerchemMIP-member1-4.tar.gz
```

See README inside the tarball.
Updated aerchem-deck-cmip6.pdf now includes the 1pctCO2 experiment.

Updated by **Declan O'Donnell** 18 days ago #7

A couple of points of concern about the results in the latest (25.05.2020) aerchem-deck-cmip6.pdf :
- Ocean output in the 1% CO2 run is very strange. MOC=0 and 3-D mean sea water potential temperature > 18C ??
- No response to volcanic eruptions, even Krakatoa, in the 4xCO2 run, any ideas why that might be ?

Updated by **Philippe Le Sager** 18 days ago #8

The 1pctCO2 is run at ECMWF and the postprocessing package is not fully/correctly installed there (more specifically this is an issue with the version of the CDFTOOLS package). That explains the strange ocean output.

As for the 4CO2 (and also 1pctCO2), a constant 1850 PI forcing is applied.

Updated by **María Gonçalves-Ageitos** 17 days ago #9

Philippe Le Sager wrote:

> ICs for 4th member are in. I've collected all four members ICs into:
> [...]See README inside the tarball.
> Updated aerchem-deck-cmip6.pdf now includes the 1pctCO2 experiment.

Thanks a lot, Philippe.

I'll proceed now to configure the BSC experiments. I have a couple of quick questions: the 4th member is still the one for 1910, right? Apart from that I have a very basic question, I wonder if the historical experiments should start at 1850 (i.e. I should change somehow the initial dates of the files) or if we just continue from 1910 to 2015. Last time I assumed the latter option was the correct setup, but I'd like to verify this with the group. Thanks!

Updated by **Philippe Le Sager** 17 days ago #10

You have to start your experiment at 1850. The gribset tool is used to change the date of IFS ICs (see the `runtime/classic/ece-esm.sh.tmpl` to see how the restarts for all components and oasis can be automatically handled). See also the #736-11 for JSON file edit.

Updated by **María Gonçalves-Ageitos** 17 days ago #11

Philippe Le Sager wrote:

> You have to start your experiment at 1850. The gribset tool is used to change the date of IFS ICs (see the `runtime/classic/ece-esm.sh.tmpl` to see how the restarts for all components and oasis can be automatically handled). See also the #736-11 for JSON file edit.

Thanks for clarifying, Philippe.

Updated by **María Gonçalves-Ageitos** 4 days ago #12

Hi again, Philippe,

I just wanted to report that the gribset for IFS was not working properly in our machine due to the date formatting. Adding a -u option for UTC in the **ece-esm.sh.tmpl** solved the issue. Lines 640-649:

```
# Initial data
     ${grib_set} -s dataDate=$(date -u -d "$run_start_date" +%Y%m%d) \
         ${init_from_restart_path}/ICMGG${prev_exp_name}INIUA \
                                                 ICMGG${exp_name}INIUA
     ${grib_set} -s dataDate=$(date -u -d "$run_start_date" +%Y%m%d) \
```

```
        ${init_from_restart_path}/ICMSH${prev_exp_name}INIT \
                                                        ICMSH${exp_name}INIT
    ${grib_set} -s dataDate=$(date -u -d "$run_start_date" +%Y%m%d) \
        ${init_from_restart_path}/ICMGG${prev_exp_name}INIT \
                                                        ICMGG${exp_name}INIT
```

If you think it's worth it, I can add this change in our projects/3.3.2.1-aerchemmip branch. Just let me know.

I'll do another check with some months and if everything checks out I hope to have both the historical and hist-piNTCF running tomorrow. I'll keep you updated.

Best,
María

María Gonçalves-Ageitos wrote:

> Philippe Le Sager wrote:
>
> > You have to start your experiment at 1850. The gribset tool is used to change the date of IFS ICs (see the `runtime/classic/ece-esm.sh.tmpl` to see how the restarts for all components and oasis can be automatically handled). See also the #736-11 for JSON file edit.
>
> Thanks for clarifying, Philippe.

Updated by **Declan O'Donnell** 1 day ago #13

I forgot to add, ensemble member 3 was started at FMI about a week ago.

Updated by **Philippe Le Sager** about 23 hours ago #14

María Gonçalves-Ageitos wrote:

> I just wanted to report that the gribset for IFS was not working properly in our machine due to the date formatting. Adding a -u option for UTC in the **ece-esm.sh.tmpl** solved the issue.
>
> If you think it's worth it, I can add this change in our projects/3.3.2.1-aerchemmip branch. Just let me know.

For `projects/3.3.2.1-aerchemmip` , yes you can commit this change. I will add it to the next versions by committing to `branches/maintenance/3.3-AerChem` , so we won't have this problem again.

Updated by **Philippe Le Sager** about 20 hours ago #15

Here's the latest aerchem-deck-cmip6.pdf. The historical run is having a real hard time to warm up...

Updated by **Tommi Bergman** about 19 hours ago #16

Philippe Le Sager wrote:

> Here's the latest aerchem-deck-cmip6.pdf. The historical run is having a real hard time to warm up...

But if you look at AOGCM runs in https://dev.ec-earth.org/issues/610#note-58, some of the runs only start warming at the point where we are now. Does some other issue have more figures on tas?