LS4P-II American Team Meeting Minutes (zoom meeting)

May.30, 2023

Present: Aaron Boone (Meteo France), Craig Ferguson (U. Albany), Diro Gulilat (ECC, Canada), Enrico Zorzetto (GFDL), Guiling Wang (U Conn), Hai Lin (ECC, Canada), Hara Prasad Nayak (UCLA), Ismaila Diallo (Penn Univ.), Michael A Brunke (U. Arizona), Paulo Nobre (CPTEC), Qi Tang (LLNL), Ruby Leung (PNNL), Ryan Muncaster (ECC, Canada), Shaocheng Xie (LLNL), Sinchan Chou (CPTEC), Weizhong Zeng (NCEP), Yongkang Xue (UCLA), Yun Qian (PNNL)

Staff: Zhijiong Cao

Yongkang Xue: present the current status, time frame, and possible topics for each group

Questions and comments:

1. TRC wave train

Hai Lin: Is this wave train kind of circular globe like teleconnection? Anomaly of surface temperature over Rocky Mountains generates the wave train, and it propagates across Atlantic and influence East Asia?

Yongkang Xue: My feeling is the wave train is generated by topography, and temperature modulates the wave train. Before people always emphasize ENSO or Asian monsoon, but never relate the wave train to Tibetan Plateau or Rocky Mountain.

Hai Lin: What generate the initial cold temperature anomaly? Response to some kind of wave train?

Yongkang Xue: TRC wave train is never discovered before and needs more study. We looked at every model and there’s deficiency in high mountain area, so we need to add the mask.

2. Assimilation

Guiling Wang: How did you address the issue with assimilation? Persistent anomaly instead of the initial anomaly when assimilating. How to address the short memory issues related to soil temperature?

Ruby Leung: We run a simulation first with soil moisture and soil temperature continuously assimilated in a fully coupled model, then we take the initial condition from this and use it to initialize and then let it go free. We found in this way the model can keep the anomalies in the land quite well because it is already in kind of good balance with the whole system.

3. Resolution

Paulo Nobre: Up today, we’re running our global coupled model, T62, in low resolution, any groups run higher resolution? It would be nice if we agreed that a few of the groups running similar resolution so that we can later compare.

Aaron Boone: Our default S2S resolution is 1.5 degrees. We’ve thought about higher resolution, but the trouble is the system is set up and used a lot, and it has 36 ensembles. There’s a motivation, if your group is going to run a couple of resolutions, we might be able to do the same thing.

Ismaila Diallo: CFS is about one degree, but we do have a version less than 40 km in case we may need to test it on the supercomputer.

Yongkang Xue: Need to consider the computer time.

Paulo Nobre: These are relatively short runs. That will make a great case if we have 2 or 3 groups could agree to run 40 km. Computer time is the problem. If by any chance we would have one of the centers involved that have computer large enough agrees that we run our models in big supercomputer, that would make it different.

Ryan Muncaster: We have one degree as well as 39 km resolution coupled model. We would be able to run both the high and low resolution, and I don’t think there would be really too big a CPU constraint for us.

Ruby Leung: When you’re talking about running coupled simulation, you refer to fully coupled of atmosphere, land, and ocean altogether?

Yongkang Xue: Yes.

Ruby Leung: We run one degree for low resolution, and for high resolution, we have 25 km for the atmosphere and 6 to 18 km for the ocean. Also have a version of the model where we only put high resolution over particular region, for example, if we do mask over Tibetan Plateau, we could use high resolution over Asia.

Aaron Boone: If we were to run the high-resolution models, our is 50 km, what would be the minimum number of ensembles we would have to do? 5 or 6 would be the minimum?

Yongkang Xue: I will mention this issue in Europe and Asia team meeting and put your idea onto slides to see how many groups willing to participate.

Qi Tang: We have 25 km for the whole North America region, and we might want to leverage on for the next phase of simulations.

Enrico Zorzetto: We usually run 1 degree. Potentially can run 0.25 degree, not sure about coupled model with ocean, but in general, we could provide a higher resolution, 6 ensemble members should not be a problem.

Yongkang Xue: Can talk to Qi Tang for the initialization.

Michael a Brunke: I will coordinate with Qi so that we can initialize. In phase one you want us to provide the model climatology data for phase two, right?

Yongkang Xue: In phase one we asked some large groups to provide climatology of model simulation, but now we don’t need it for phase two.

4. NOAA UFS update

Weizhong Zheng: NOAA is developing UFS model. NOAA NP land surface model is testing to replace the traditional one, and the soil temperature and ground flux are quite different. If you use the new one, maybe you will find large difference.

Yongkang Xue: We will discuss this issue.

5. Time frame

Yongkang Xue: How’s the time frame? We try to finish in the middle of next year. Contact Hara and me if need help on the mask.

Hara: The temperature memory is important to keep and that’s challenging. Probably some of the land surface processes trigger temperature your anomaly, which we need to take care.

6. Further discussion

Craig Ferguson: Have the biome that all the modelers feel comfortable keeping the same initialization approach. Have spatial and temporal scales of the variables that everyone is agreeing to contribute to the community.

Yongkang Xue: The target is each model produce the best observed temperature anomaly. For the initialization, have different approaches, hard to have a standard approach for every model, especially some models’ behavior being asymmetric. For higher resolution, we need to consider carefully and have a protocol. Need to have more details.