WGNE35

2-5 November 2020

Action list

(R - Recommendation, AI - Action Item)

1. **Systematic errors :** extend survey to other components of the ESM:
    a. Systematic errors in land models and their priority order. **AI: Mike Ek** to consider whether a current document exists providing a community view or whether GLASS could co-ordinate something (e.g. survey or a new BAMS Review paper covering weather and climate).
    b. Systematic errors in ocean and sea-ice models and their priority order. **AI: Baylor** to consider whether a current document exists providing a community view or whether OMDP could co-ordinate something (e.g. a survey; review paper)
    c. Atmospheric composition/bio-geochemistry (**AI: Ariane** to ask GAW about this, ties with Aerosol project)
    d. Coupled system systematic errors (**AI: Oscar** will reach out to Cath Senior/WGCM/CMIP or others as appropriate to find out if something currently exist, or is a new survey worthwhile)
    e. Middle atmosphere (**AI: Carolyn** will ask John McCormack/SPARC about this)

2. **Stochastics physics :**
    a. centers to consider running SCM and/or analysis and refining protocols (**AI : all**)
    b. WGNE contact for the stochastic physics project (**AI: Nils**)

3. **Synergies on High Altitude Modeling :** include presentation from SPARC and NCAR on this topic at WNE36 (AI Co-chairs)

4. **GASS:**
    a. Coordinate with momentum flux project COORDE and GEWEX. Recommend GEWEX to form a formal link between COORDE and TEAMX (**R : GASS**)
    b. Presence at PanGASS in Monterey (**AI: Carolyn/Ron to present WGNE priorities on systematic errors and parameterization**).

5. **MJO Task Force** : Recommend considering both options to get two more members AND entrain early career scientists through e.g. presentations (**AI : Charlotte**)

6. **Exascale/scalability:**
    a. Encourage use and make available community tools, develop best practices and standards (**AI: all,** post appropriate links on the WGNE web site)
    b. Develop a summary of community tools and advice for modelling centres and publish on WGNE web page, should be evolving document that folks can add to (see above) (**AI: Nils**)

7. **Machine Learning**: prepare ML review for next year WGNE session (**AI: Fanglin and Francois E**). Consider Machine Learning approaches to understand and correct systematic errors

8. **WMO Research Board Task Team on Exascale and Machine Learning Task Team**: act as WGNE rep. Length of commitment TBD after January. (**AI: Tim, and Oscar as backup for Machine learning**)

9. **Ensemble methods**: consider Exploring ML to derive uncertainties instead of running ensemble and contribute inputs at future WGNE meetings (**R: all**)

10. **TC verification**:
    a. Review paper of TC initialization with DAOS involvement (**AI: Masashi** as contact point for WGNE).
    b. Coordinate work to understand why all current initialisation methods result in TC's which are too weak despite models being capable of producing stronger TC's (**AI: Masashi** with DAOS, possibly part of review above)

11. **JWGFVR:**
    a. Increase focus on process orientated metrics to address systematic errors in support of WGNE ala Charlotte's diagnostics (**R: JWGFVR**)
    b. Keep liaising with TC verification / JMA /CMDP (**R: JWGFVR**)
    c. Adopt an Earth system verification approach (coupling, atmospheric composition) (**R: JWGFVR**). Next workshop will have a session on ocean verification. (**AI: Caio** to send JWGFVR meeting info to OMDP)
    d. Explore DA or climate verification person to join as member (**AI: All**, pass recommendations onto Caio)

12. **Precipitation verification**: Consider distribution of precipitation (e.g. SEEPS scores) and entrain NWP in the effort (**AI: Peter**)

13. **Verification**:
    a. Bring topic to Research board to check best approach to synergize across timescales and programs (**AI: Keith or Carolyn**)
    b. Keep liaising with TC verification (**R: JMA and CMDP**, and maintain JWGFR informed to provide feedback if needed)
    c. Liaison between CMDP and JWGFVR on NWP-Climate collaboration (via Verification workshop and joint review of CMDP precipitation verification effort) (**R: Caio and Peter to consider**)

14. **WGCM**: Systematic errors: breakdown of CF (cf CFMIP study) can help gaining insights into high sensitivity components. Once key systematic errors are identified, these could form the basis of joint work between WGNE and WGCM (**R: co-chairs**). Tie into DIMOSIC (**AI: Ron will talk to Linus**)

15. **PPP/YOPP/MOSAIC**: Consider using high resolution sea-ice models to explore parameterization of sea-ice (leads, etc) at coarser resolution e.g. for climate models (**R: Thomas and Gunilla**)

16. **DAOS: Potential areas for collaboration**:
    a. Coupled initialization – Agreed would be a good joint project between WGNE, DAOS and OMDP. Next step is to set up a meeting between interested people from the three groups. Daryl recommended Andy Moore from DAOS, Baylor and others from OMDP (**AI: Tim Graham as WGNE rep**)

    b. Use of DA for activities outside of creating initial conditions – Agreed next step is for WGNE to conduct a review of current activities in this area, to be presented at WGNE36 and a future activity with DAOS discussed there. (**AI: Reynolds with DAOS**)

    c. Including evaluation, defining boundaries, of AI/ML methodology including TL/AD emulators. (**R: Daryl to consider this for part of their DA workshop. Could be a topic for WGNE error workshop in 2022**)

17. **OMDP: Potential areas for collaboration:**

    a. Work on getting an OMDP member or ex-officio. Baylor said appropriate person would depend on what joint project we take forward (which may end up being coupled DA). Secretariat recommends we bring them on as official member (OMDP member or possibly ex-officio could become WGNE member) (**AI: Co-chairs**)

    b. High Performance Computing (hybrid GPUs, mixed precision) (**AI: Nils** will get input from Baylor or OMDP for next year's exascale overview)

18. **HIWeather connection**: possibly through very high-res nowcasting for Paris Olympics demonstration (2022 and 2024) and/or how to measure value of sub-km scale/urban forecasting. (**AI: Co-chairs** to invite presentation on this topic for WGNE36 and to remember to loop in GLASS - Kirsten Findell, Anne Verhoef - and GAW group focused on urban modelling - GURME)

19. **WGNE table** in re system configuration and provide Günter with contacts for centres without WGNE representation (**R: all members**)

20. **Projects final review**: consider some form of objective evaluation (**AI: co-chairs** to include as discussion topic at WGNE36)

21. **WGNE web site : (AI : Elena, all)**

    a. Check information is up to date on website on projects (MJO TF, model uncertainty, etc)

    b. Update « Upgrades of NWP systems » web page

22. **Meetings**:

    a. **WGNE36**: Possible offer from NCAR to host the session in 2021 and from CPTEC 2022 (**AI: Mike and Peter to confirm NCAR to host in 2021**)

    b. Systematic Error Workshop: offer from ECMWF to hold meeting on 31 Oct - 4th Nov 2022 (**AI: Nils**)

23. **WGNE Membership :** continue expanding expertise to include wider Earth system modeling components (**AI: co-chairs**)