WGNE 34
DWD, Offenbach, Sep 24th-27th, 2019

This session is being held in the context of a recently approved WMO Constituent Body Reform and a recently approved new WCRP Strategic plan, offering WGNE a great opportunity to contribute to broader and more integrated Earth system numerical model developments around the weather-climate enterprise. The agenda of the meeting is currently being designed to tackle these important challenges across our WCRP, WWRP and GAW research programmes.

The expected outcomes of the meeting will be:
- to develop a roadmap for an expanded WGNE;
- to develop a 'Fast-Track' initiative in the context of the WCRP Implementation Plan;
- to propose concrete projects to bridge to new partners outside the typical WGNE remit;
- to discuss governance options in light of the new WMO Research Board.

MEETING WEB PAGE:
https://www.dwd.de/EN/specialusers/research_education/seminar/2019/wgne34_en/wgne34_en_node.html

WGNE WEB PAGE: http://wgne.meteoinfo.ru/

TUESDAY SEPTEMBER 24TH

0900-1030	Welcome, adoption of the agenda (10 mins)	Co-chairs
	Local arrangements. (5 min)	Gunther Zangl
	Welcome by DWD (10 min)	Sarah Jones
	WWRP overview (strategy and implementation) (15 min)	Sarah Jones
	GAW overview (strategy and implementation) (15 min)	Greg Carmichael
	WCRP overview (strategy and implementation) (15 min)	Detlef Stammer (time TBD)
	The role of WGNE in light of WMO reforms (10 min)	Michel Rixen
	WGNE in the context of GDPFS (10 min)	Eunha Lim
1030-1100	**Coffee**	
1100-1230	Summary of systematic errors survey and development of WGNE priorities in light of WMO reforms (30 min) **Updates on WGNE projects & related work aligned with strategic priorities**	WGNE co-chairs

	Surface fluxes project (20 min)	Carolyn Reynolds / Francois Bouyssel
	WGNE-S2S-GAW Aerosols project (20 min)	Ariane Frassoni / Francois Engelbrecht
1230-1330	**Lunch**	
1330-1500	GASS report incl. joint WGNE-GASS drag and grey-zone projects (30 min)	Daniel Klocke
	GLASS report (20 min)	Mike Ek
	Stochastic physics project (15 min)	Keith Williams (for Hannah Christensen)
	Initial tendency project (15 min)	Keith Williams
1500-1530	**Coffee**	
1530-1700	**Other WGNE activities and collaborations**	
	Report from DAOS including coupled NWP initialisation and discussion on TC intensity initialisation (20 min)	Daryl Kleist and Ulrich Loehnert (by VC)
	Updates on WGNE projects & related work aligned with strategic priorities cont.	
	Machine learning (invited talk) (25 min)	Peter Dueben (by VC)
	MJO-TF report incl. progress with YMC exploitation (25 min)	Daehyun Kim

WEDNESDAY SEPTEMBER 25ᵀᴴ

0900-1030	WMO reform (10 min) Key priorities for the Research Board (20 min including Q&A) - Science for Services exploiting a Value Cycle Approach - Innovation in regions, strengthening capacity in less developed countries and SIDS - Fostering an integrated and multidisciplinary research approach **Updates on WGNE projects & related work aligned with strategic priorities cont.** Exascale review update (atmosphere and ocean model scalability & dwarf components) (30 min) Report on reduced precision tests (30 min)	Gerhard Adrian Paolo Ruti Nils Wedi Nils Wedi
1030-1100	**Coffee**	
1100-1230	Review of machine learning activities in centres (20 min) **Knowledge expansion areas for WGNE** Longer timescale ESM components (carbon cycle, chemistry, etc.) (25 min) Hydrology modelling (invited talk) (25 min)	Keith Williams Tatiana Ilyina (by VC) Simon Dadson (by VC)
1230-1330	**Lunch**	
1330-1500	**Other WGNE activities and collaborations** YOPP and the Polar Prediction Project (20 min) HIWeather Project (20 min) Nowcasting and Mesoscale WG (20 min) Coupled Atmospheric Composition - Meteorology/Climate Modelling – recent progress and new challenges (20 min)	 Gunilla Svensson Michael Riemer Peter Steinle Angela Benedetti (by VC)
1500-1530	**Coffee**	
1530-1700	WGNE computing table (15 min)	Gunther Zangl

	Developments in numerical methods (45 min)	Michael Baldauf / Nils Wedi
	Report from SPARC focus on errors in the representation of the stratosphere and coupling with predictability of the troposphere (20 min)	John McCormack (by VC)
18:30	**Conference dinner (invited)**	

THURSDAY SEPTEMBER 26TH

0900-1030	**Other WGNE activities and collaborations cont.**	
	CMIP6 (incl. HighResMIP and systematic errors) status (20 min)	Cath Senior (by VC)
	WGCM report (with particular focus on climate change related analysis of relevance for model development) + discussion on future interaction between the groups (20 min)	Cath Senior (by VC)
	Timescales on which systematic errors develop (20 min)	Julio Bacmeister
	WGNE Blue book (15 min)	Elena Astakhova
1030-1100	**Coffee**	
1100-1230	**WGNE member presentations** (focus on fixing model deficiencies and/or coupling to other ESM components)	
	Reducing systematic biases with improved physics in NOAA's next generation global prediction system (20 min)	Fanglin Yang
	Climate sensitivity in CESM (20 min)	Julio Bacmeister
	Reducing systematic errors in DWD models (20 min)	Gunther Zangl
	JMA activities for reducing systematic errors (20 min)	Masashi Ujiie
1230-1330	**Lunch**	
1330-1500	**WGNE member presentations cont.**	
	Commodore Ocean (20 min)	Nils Wedi
	Ocean numerics on the Uniform Jacobian cubed sphere (20 min)	Francois Engelbrecht
	Research in numerical modelling at the Hydrometcenter of Russia (20 min)	Elena Astakhova

	Addressing the cause of large-scale circulation errors in the Met Office global model (20 min)	Keith Williams
1500-1530	**Coffee**	
1530-1730	**Verification** Tropical cyclone verification (20 min) JWGFVR report including progress with process-orientated and surface verification (25 min) CMDP – Climate precipitation panel report (25 min) Discussion of progress with joint JWGFVR-CMDP activities (15min)	 Masashi Ujiie Marion Mittermaier Peter Gleckler (by VC)

FRIDAY SEPTEMBER 27ᵀᴴ

0900-1030	**Discussion:** 1) Gaps to address high ranking systematic errors and projects required to address these 2) Challenges and opportunities on exascale/stochastic physics/machine learning and WGNE role 3) Ideas for "Fast Track" initiative(s) on model development 4) WGNE role in promoting large international modelling efforts and associated partnerships 5) Roadmap for a WGNE evolution on Earth system modelling 6) WGNE's role in developing the seamless GDPFS 7) Governance options in light of new WMO Research Board	Co-chairs to lead
1030-1100	**Coffee**	
1100-1230	Summarise actions from the meeting, including any outstanding actions from WGNE-33. Date and location of next meeting and close	Co-chairs
1230	**Close**	

Background information for the discussion on Friday 27th September

1) <u>Gaps to address high ranking systematic errors and projects required to address these</u>

Following the WGNE Systematic Error Workshop and a subsequent survey, WGNE has identified a number of key priorities to address systematic errors, in particular:
- Convection: Joint WGNE-GASS grey zone phase II project and EUREC4A and GATE III field campaigns, WGNE MJO-TF focus on exploiting YMC observations
- Surface fluxes new project with initial focus on the ocean
- …

For additional infos, see:
- https://www.wcrp-climate.org/JSC40/12.7.%20WGNE_for_JSC40_0519.pdf
- https://www.wcrp-climate.org/JSC40/12.7b.%20WGNE_Systematic_Error_Survey_Results_20190211.pdf

2) <u>Challenges and opportunities on exascale computing/stochastic physics/machine learning and WGNE role</u>

See dedicated WGNE34 presentations.
See also https://www.wcrp-climate.org/JSC40/10.4_FastEmergingTopics-JSC40_PKabat.pdf

3) <u>Ideas for "Fast Track" initiative(s) on model development</u>

Some emerging WGNE topics on Earth system modelling, exascale modelling, machine learning, etc could be attractive to a number of WMO members, donors, sponsors, foundations, agencies. What would be WGNE's priorities, recommendations, and role?

4) <u>WGNE role in promoting large international modelling efforts and associated partnerships</u>

WGNE, as the international body to coordinate numerical experimentation across weather and climate communities, could play an active role in strategizing, leading and/or supporting major flagship projects like Extreme Earth (https://www.extremeearth.eu/), not only at the implementation level, but also in co-designing calls for agencies to support them or elements thereof (see for example https://schmidtfutures.com/our-work/scientific-knowledge/vesri/).

5) <u>Roadmap for a WGNE evolution on Earth system modelling</u>

Following the WGNE33 session discussion and in preparation for JSC40, WGNE had developed a proposal for an evolution of its scope/mandate in the context of the WCRP New Strategy and WMO Constituent Body Reform

See https://www.wcrp-climate.org/JSC40/12.7c.%20WGNE_WCRP-CASreform_positional.pdf

6) WGNE's role in developing the seamless GDPFS

Model development should be an integral part of a data processing and forecasting system, so that gradual improvements on the research side can be transitioned as appropriate into operations. Vice-versa, feedback from operational systems shall inform research priorities and investments. How can WGNE strengthen this data-processing-forecasting value cycle across NMHs, academia and agencies?

See
https://www.wmo.int/pages/prog/www/DPS/documents/DraftofSEAMLESSGDPFSIMPLEMENTATIONPLANver4.0.pdf

7) Governance options in light of new WMO Research Board

Terms of Reference for WGNE will have to be revisited. The relationship to the WMO Research Board will have to be defined.

See
- WGNE : http://wgne.meteoinfo.ru/sample-page/terms-of-reference/
- Research Board: https://library.wmo.int/doc_num.php?explnum_id=9866
  (page 45)

Rapporteurs taking notes during the session and providing a 1 slide summary for the discussion on Friday:

Question 1: Ron Mctaggart-Cowan
Question 2: Daniel Klocke
Question 3: Ariane Frassoni
Question 4: Peter Steinle
Question 5 : Nils Wedi
Question 6: Eunha Lim
Question 7: Michel Rixen