

# The role of stratosphere - troposphere coupling in sub-seasonal to seasonal prediction using the S2S database

**Daniela Domeisen**

ETH Zurich, Switzerland

Amy H. Butler (CIRES / NOAA), Andrew J. Charlton-Perez (U. Reading)  
Blanca Ayarzagüena (U. Complutense de Madrid), Mark P. Baldwin (U. Exeter), Etienne Dunn-Sigouin (U. Bergen / Bjerknes Centre), Jason C. Furtado (U. Oklahoma), Chaim I. Garfinkel (Hebrew University), Peter Hitchcock (LMD / Cornell U.), Alexey Yu. Karpechko (FMI), Hera Kim (Seoul National U.), Jeff Knight (UK MetOffice), Andrea L. Lang (U. Albany), Eun-Pa Lim (BoM), Andrew Marshall (BoM), Greg Roff (BoM), Chen Schwartz (Hebrew U.), Isla R. Simpson (UCAR), Seok-Woo Son (Seoul National U.), Masakazu Taguchi (Aichi University of Education)

# SUB-SEASONAL TO SEASONAL PREDICTION: WHERE DO WE STAND?

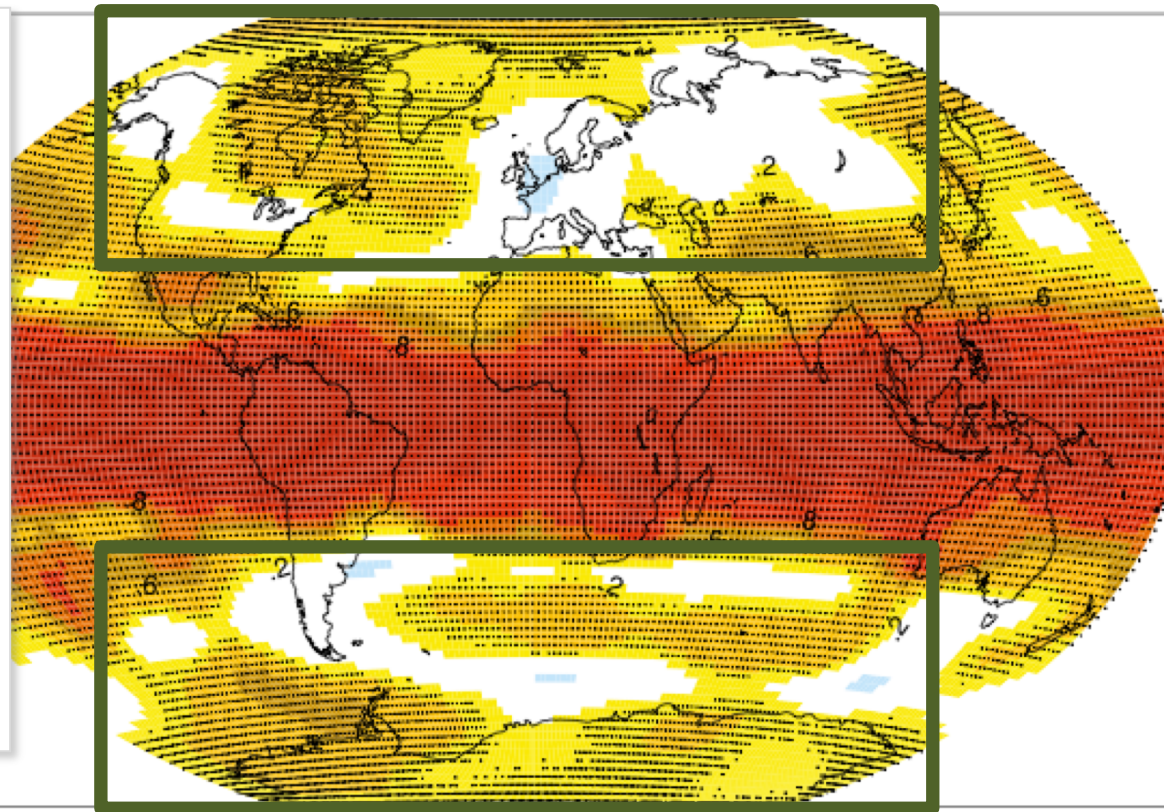
## Limited prediction skill outside of the tropics

Prediction skill for  
December – February

Initialization:  
November

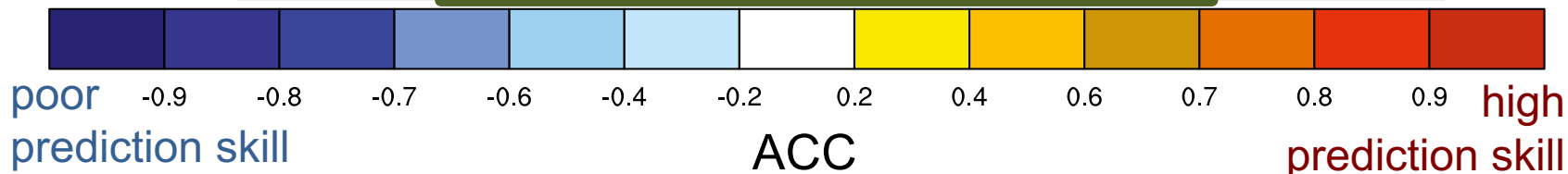
Model: Max-Planck-  
Institute Earth System  
Model (MPI-ESM-LR)  
/ German Climate  
Forecast System  
version 1

Baehr et al., 2015,  
Clim. Dyn.



Use the longer  
term  
predictability  
from  
stratosphere  
to improve  
prediction skill

Figure from:  
Domeisen et al.,  
2015, J.Climate.



# USING THE S2S HINDCAST DATABASE

## Using all available stratospheric data

	Model	Rfc length	Resolution	Rfc period	Rfc frequency	Ensemble size
*	BoM	D 0-61	T47 L17	1981-2013	6/month	33
*	CMA	D 0-59	T106 L40	1994-2014	6/month	4
*	ECCC	D 0-31	0.45°x0.45° L40	1995-2014	Weekly	4
*	ECMWF	D 0-46	T639/319 L91	1997-2016	2/week	11
	HMCR	D 0-61	1.1°x1.4° L28	1985-2010	Weekly	10
*	CNR-ISAC	D 0-32	0.75°x0.56° L54	1981-2010	Every 5 days	1
*	JMA	D 0-33	T319 L60	1981-2010	3/month	5
*	KMA	D 0-60	N216 L85	1991-2010	4/month	3
	CNRM-Meteo	D 0-60	T255 L91	1993-2014	2/month	15
	NCEP	D 0-44	T126 L64	1999-2010	6/month	4
*	UKMO	D 0-60	N216 L85	1993-2015	4/month	4

\* used in this analysis

Figure: H. Kim