Sources of Subseasonal Precipitation Skill in South America

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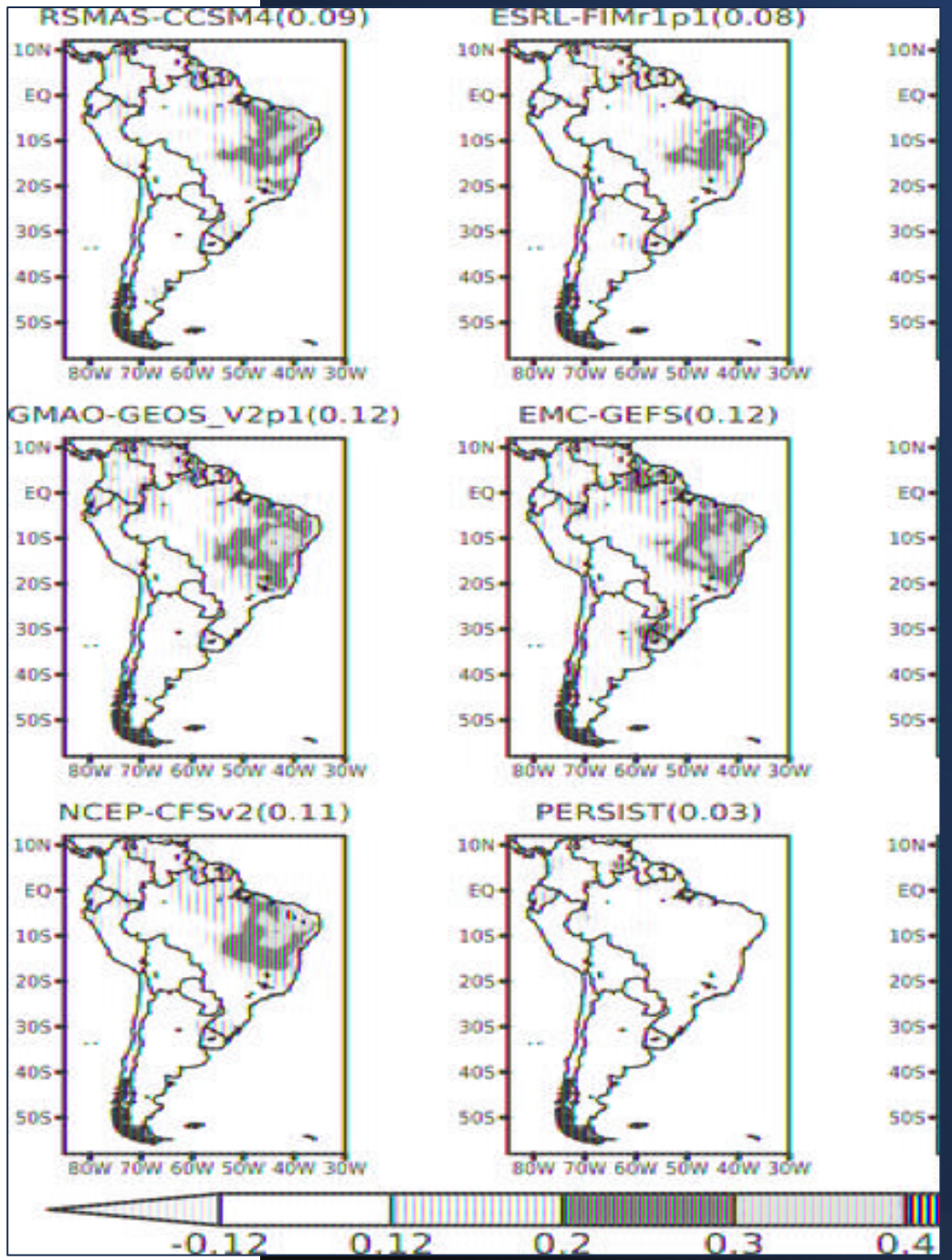
Acknowledgements: Yaga Richter, Sasha Glanville

Average precipitation skill on subseasonal timescales is lacking globally.

The only region with *average* subseasonal precipitation skill is Brazil.

While the skill is relatively low (~0.2-0.3) this indicates that there are many more skillful forecasts in this region than other regions over the hindcast period.

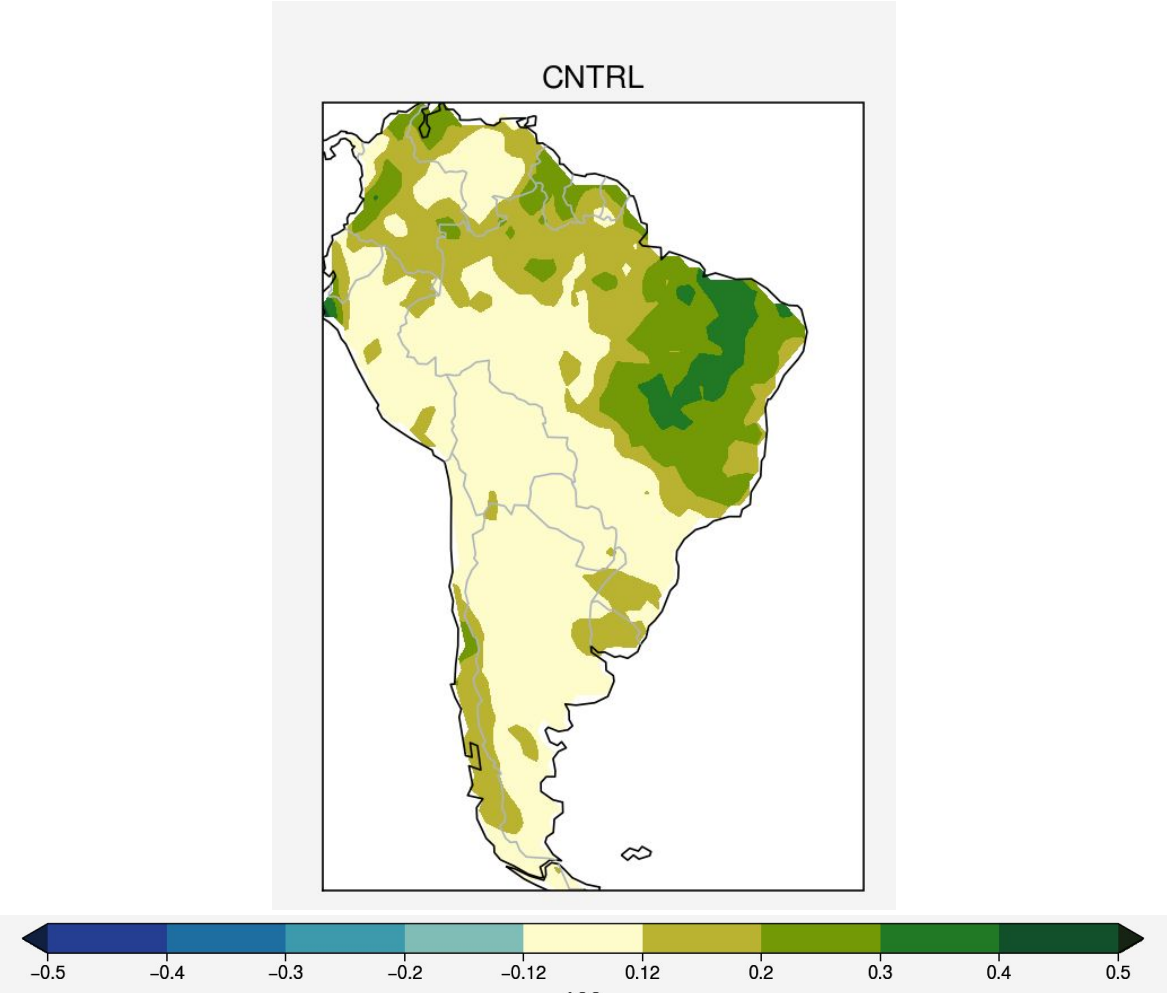
What is the source of this predictability?

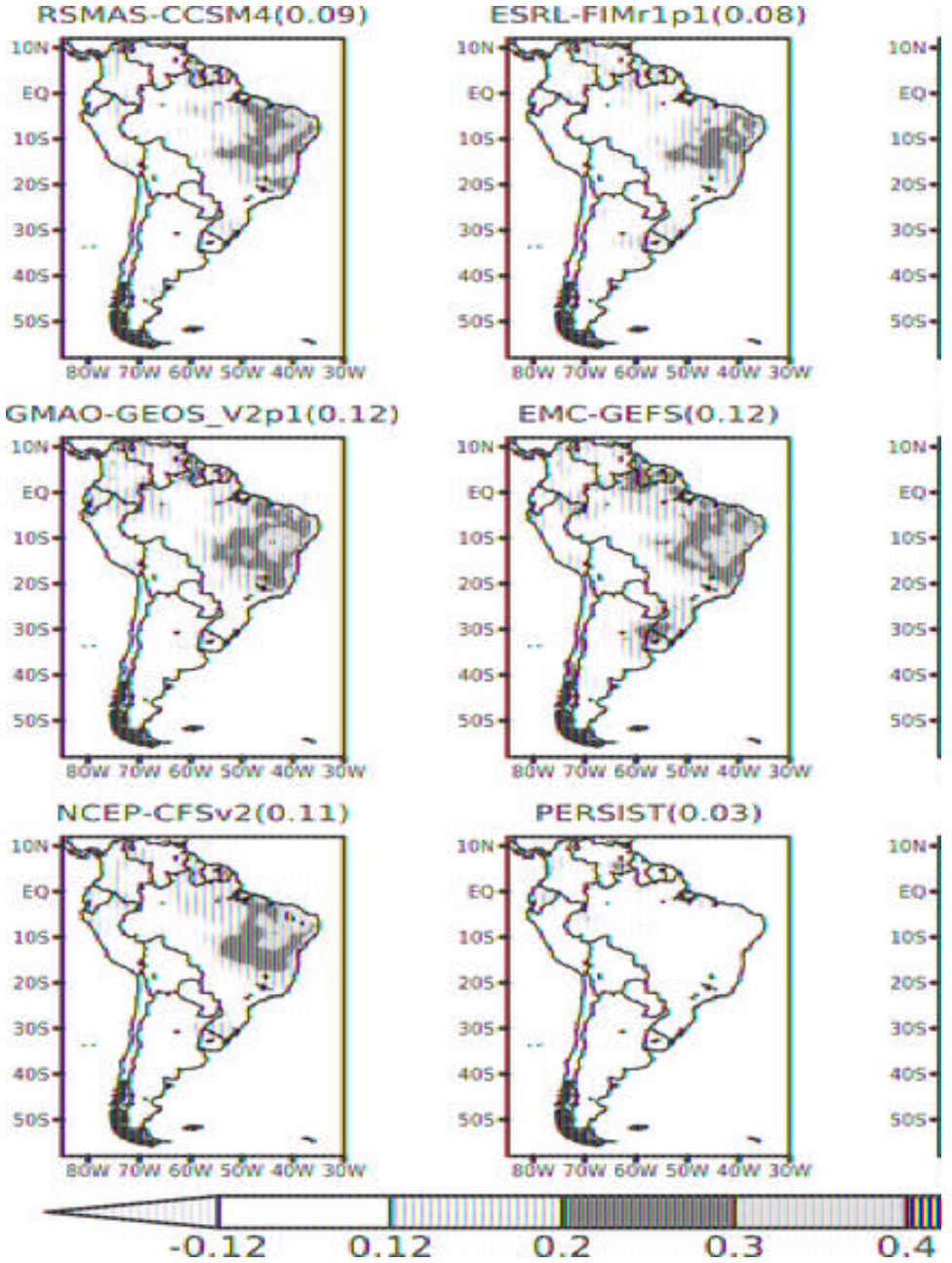


from Pegion et al 2019, BAMS

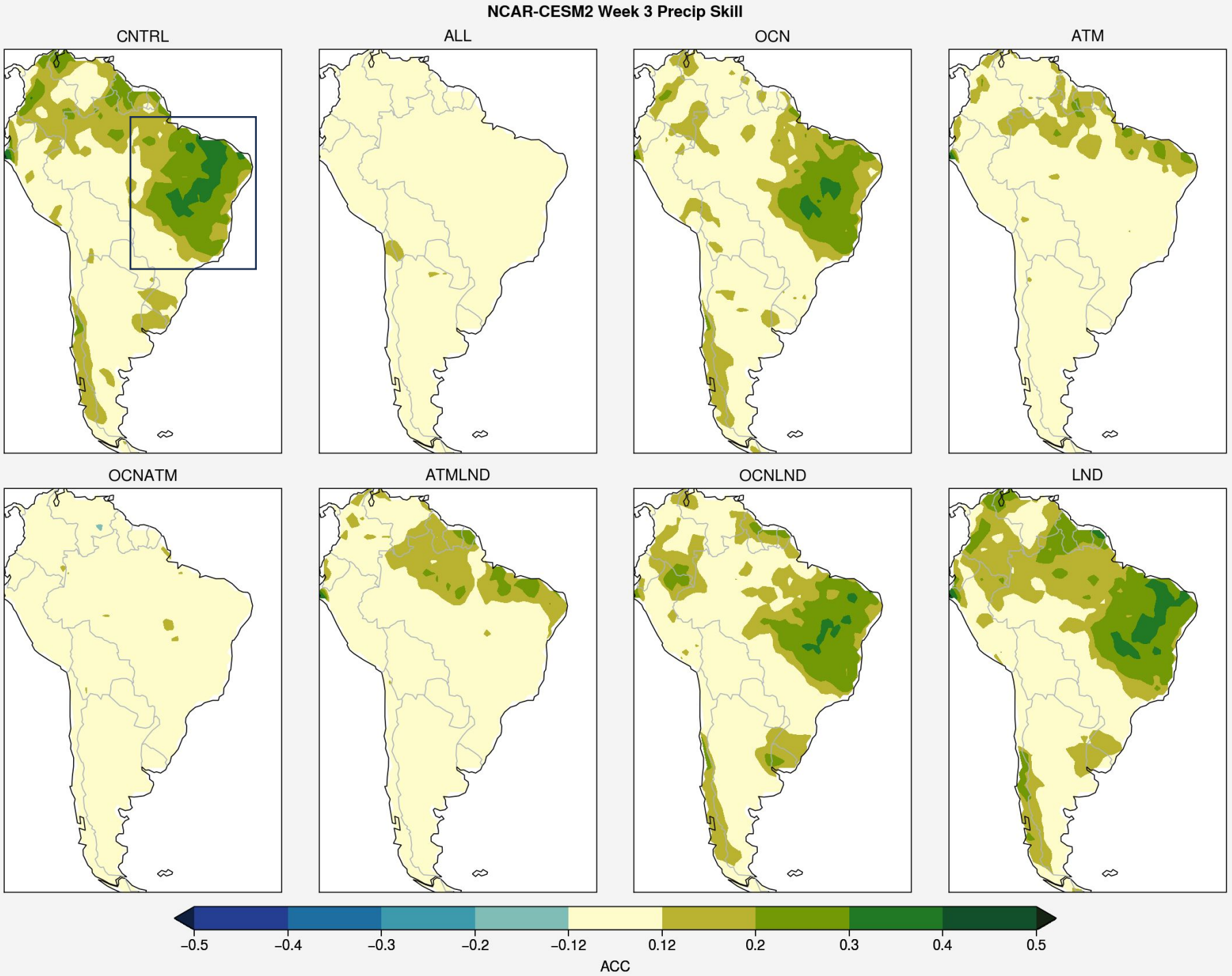
NCAR-CESM2 Subseasonal hindcasts

EXP	ATM	OCN	LND
CNTRL	X	X	X
ATM	CLIMO	X	X
OCN	X	CLIMO	X
LND	X	X	CLIMO
ATMOCN	CLIMO	CLIMO	X
ATMLND	CLIMO	X	CLIMO
OCNLND	X	CLIMO	CLIMO
ALL	CLIMO	CLIMO	CLIMO

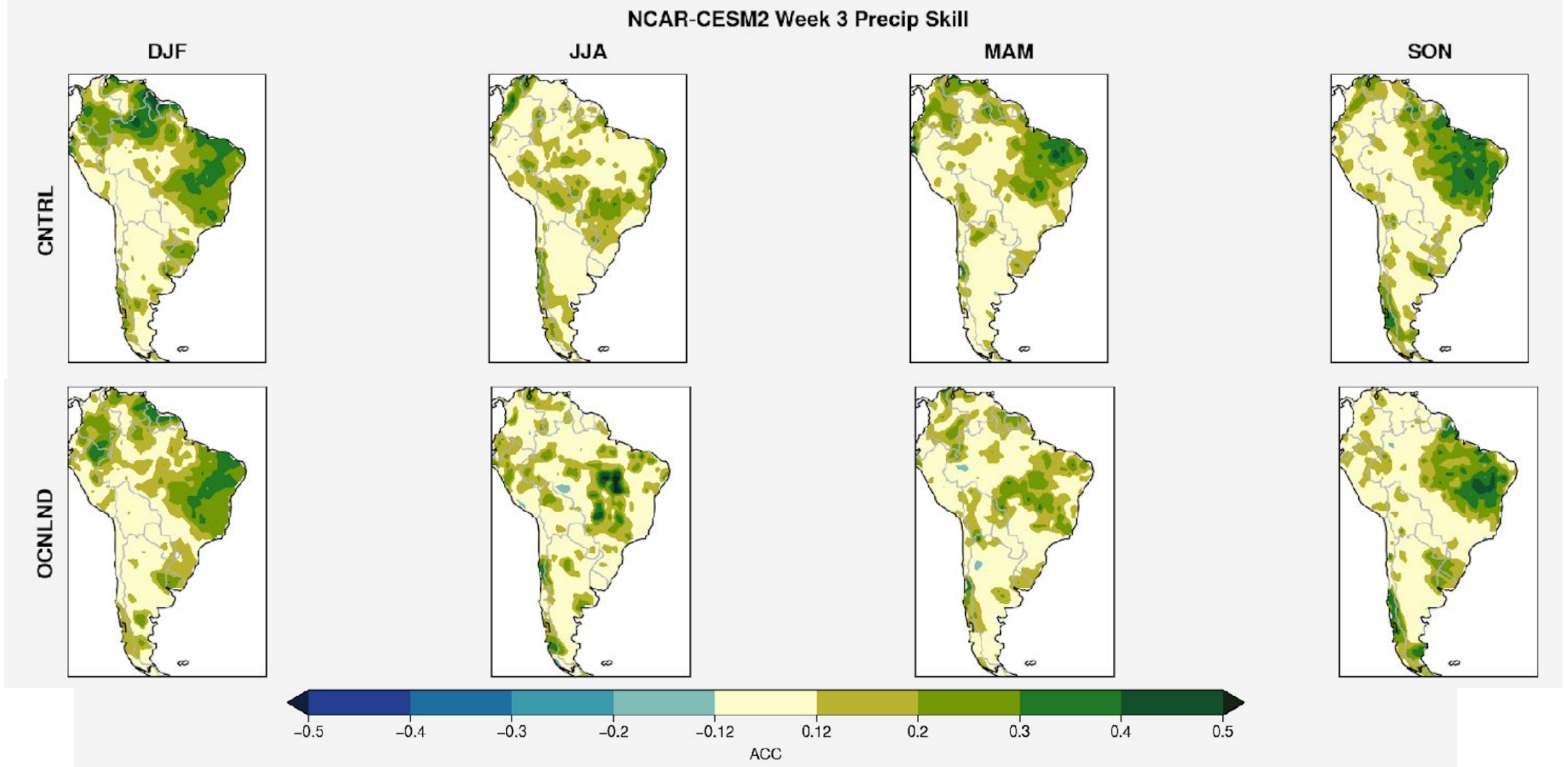




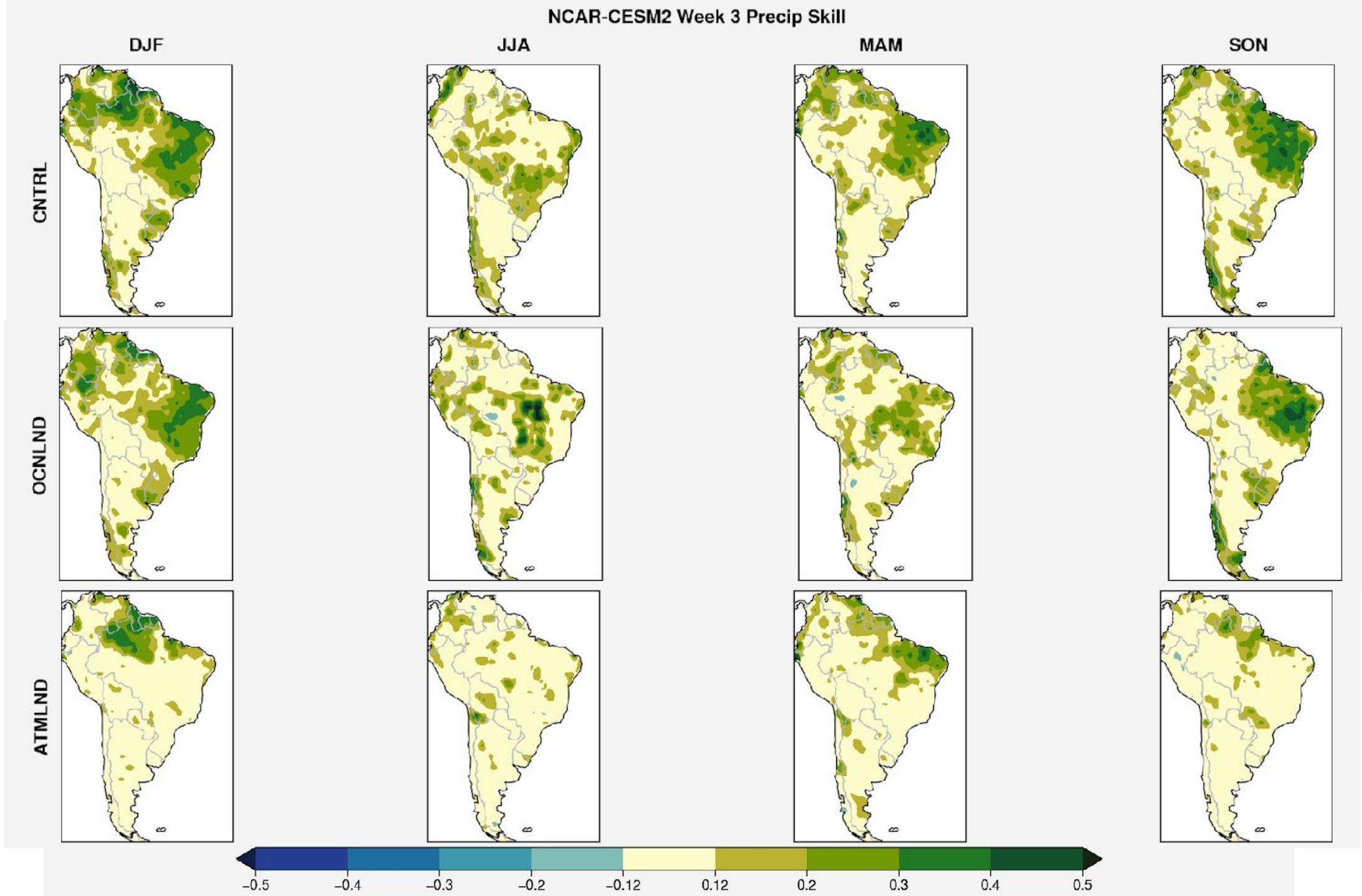
NCAR-CESM2 has similar SA precip skill for week 3 as other models



Skill can primarily be attributed to the atmospheric initial conditions & some ocean initial conditions.



Skill is highest in DJF and SON
Atm ICs provide the majority of skill during these seasons
Some skill is coming from elsewhere in MAM


NCAR-CESM2 Week 3 Precip Skill
DJF
JJA
MAM
SON
CNTRL
OCNLND
ATMLND
−0.5
−0.4
−0.3
−0.2
−0.12
0.12
0.2
0.3
0.4
0.5

Subseasonal Precipitation Skill in SA

- Atmosphere is primary source of predictability in SON & DJF
- Ocean is a secondary source of predictability in MAM
- Skill is low in JJA & mostly from atmosphere
- Land ICs are not important to SA precip skill

Next Steps

- Diagnose ATM & OCN ICs associated with skillful forecasts
- Identify the potential predictors associated with these initial conditions