Supplemental Material

Journal of Climate

Seasonal Forecasts of Tropical Cyclones Using GFDL SPEAR and HiFLOR-S

https://doi.org/10.1175/JCLI-D-24-0356.1

Supporting Information for

Seasonal Forecasts of Tropical Cyclones using GFDL SPEAR and HiFLOR-S

Hiroyuki Murakami[1], Thomas L. Delworth[1], Nathaniel C. Johnson[1], Feiyu Lu[1,2],

Colleen E. McHugh[1,3], and Liwei Jia[1]

[1]*National Oceanic and Atmospheric Administration/Geophysical Fluid Dynamics Laboratory, Princeton, NJ, USA*

[2]*University Corporation for Atmospheric Research, Boulder, CO, USA*

[3]*Science Applications International Corporation, Reston, VA, USA*

Introduction

This supplementary information includes seven figures and two tables that support the findings of this study.

Supplementary Figure 1: As in Fig. 1, but for HiFLOR-S and HiFLOR.

Supplementary Figure 2: As in Fig. 2, but for landfalling TC frequency. (a) U.S. coast (USA), (b) Caribbean Islands (CAR), and (c) Hawaii (HI).

Supplementary Figure 3: As in Figs. 3a, b, but focusing exclusively on landfalling variables for the US, CAR, and HI.

Supplementary Figure 4: As in Fig. 6, but for HiFLOR-S and HiFLOR.
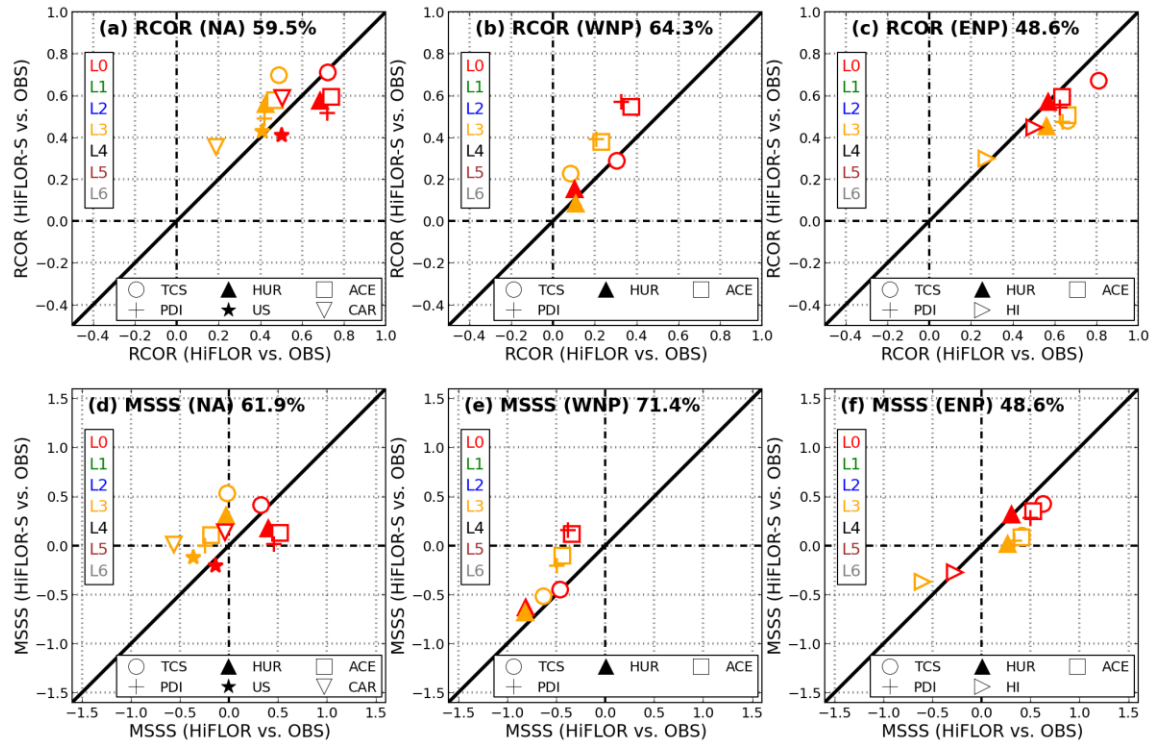
Supplementary Figure 5: As in Fig. 3, but for HiFLOR-S and SPEAR.

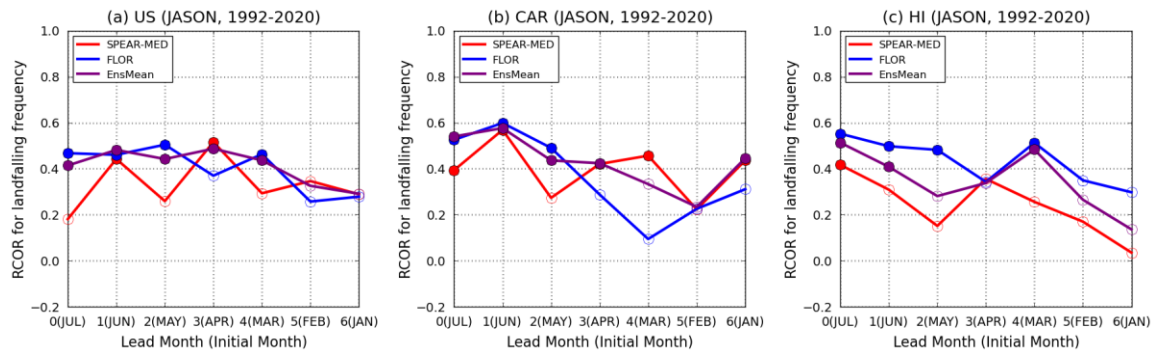Supplementary Figure 6: As in Fig. 6, but for HiFLOR-S and SPEAR.

Supplementary Figure 7 As in Fig. 7, but for SPEAR and HiFLOR-S at lead-month 3 predictions.

Supplementary Table 1 As in Table 2, but for SPEAR and HiFLOR-S at lead-month 3 predictions.

Supplementary Table 2: As in Table 3, but for SPEAR and HiFLOR-S at lead-month 3 predictions.
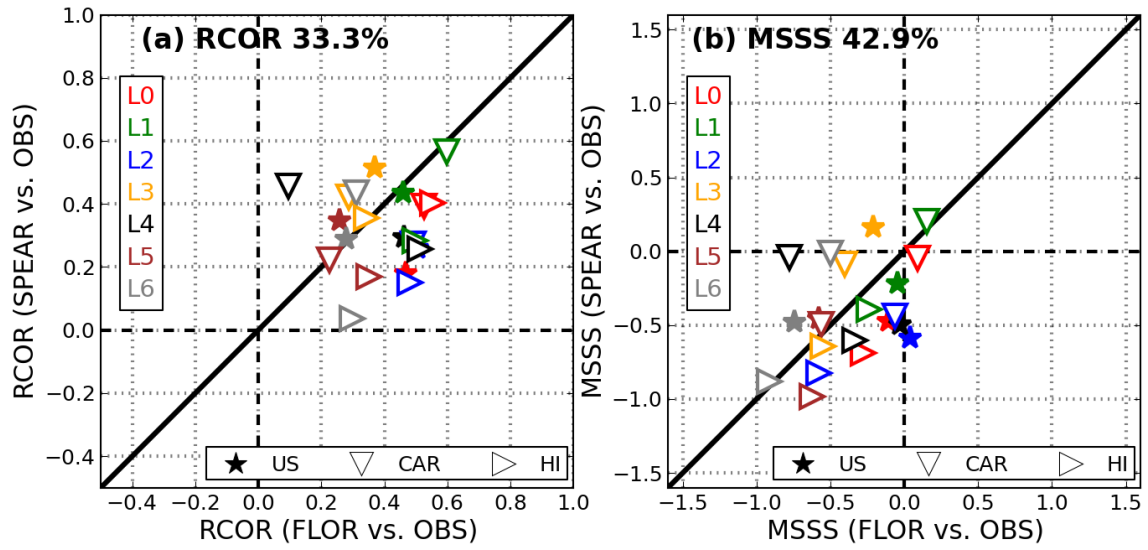
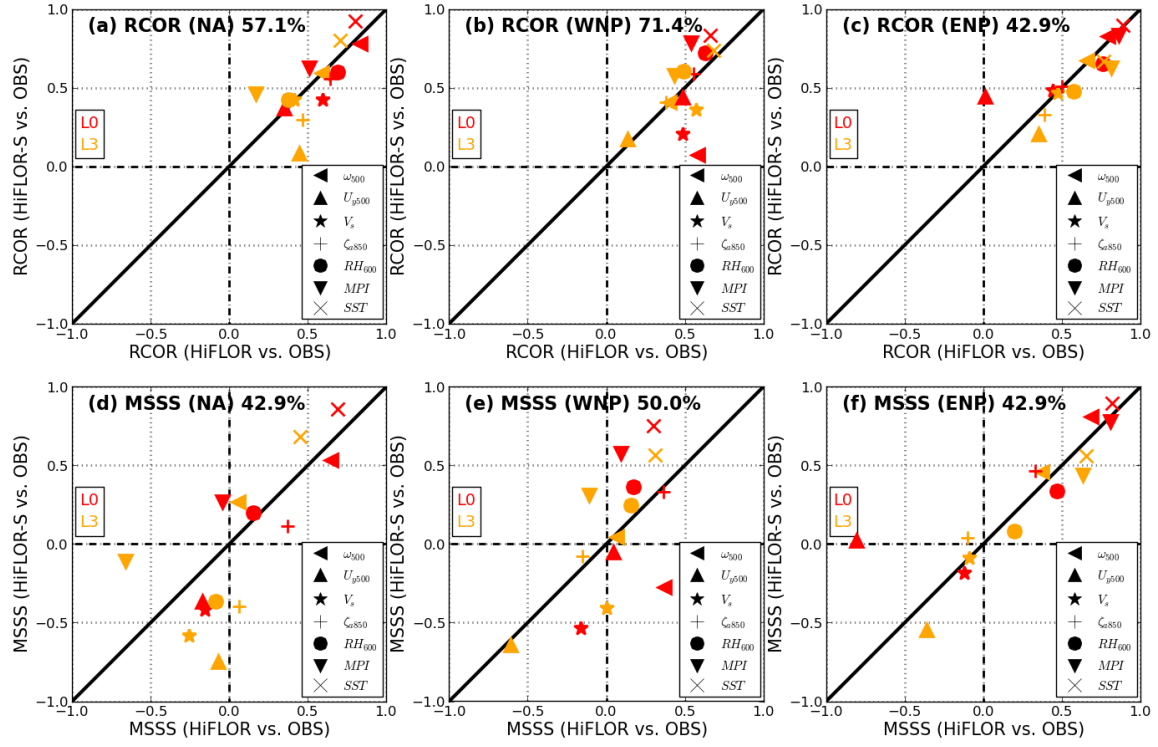**Supplementary Fig. 1** As in Fig. 3, but for HiFLOR-S and HiFLOR.

Supplementary Fig. 2 As in Fig. 2, but for landfalling TC frequency. (a) U.S. coast

(USA), (b) Caribbean Islands (CAR), and (c) Hawaii (HI).

Supplementary Fig. 3 As in Figs. 3a, b, but focusing exclusively on landfalling variables for the US, CAR, and HI.

Supplementary Fig. 4 As in Fig. 6, but for HiFLOR-S and HiFLOR.
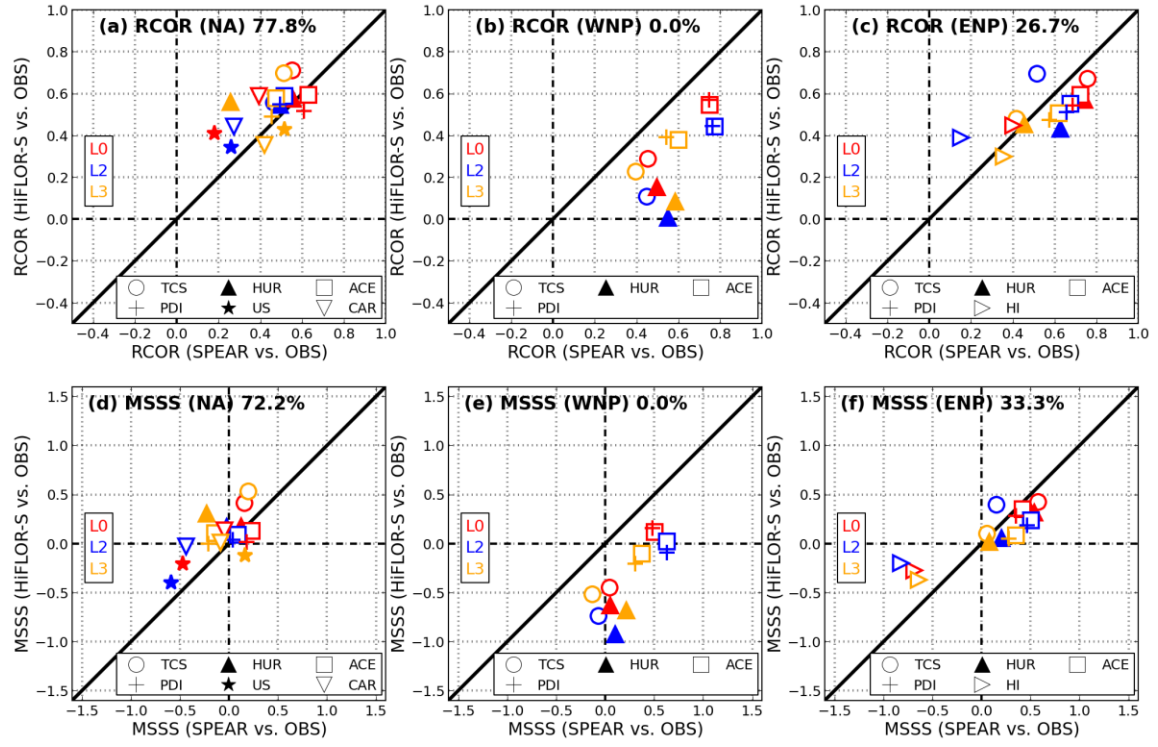
Supplementary Fig. 5 As in Fig. 3, but for HiFLOR-S and SPEAR.
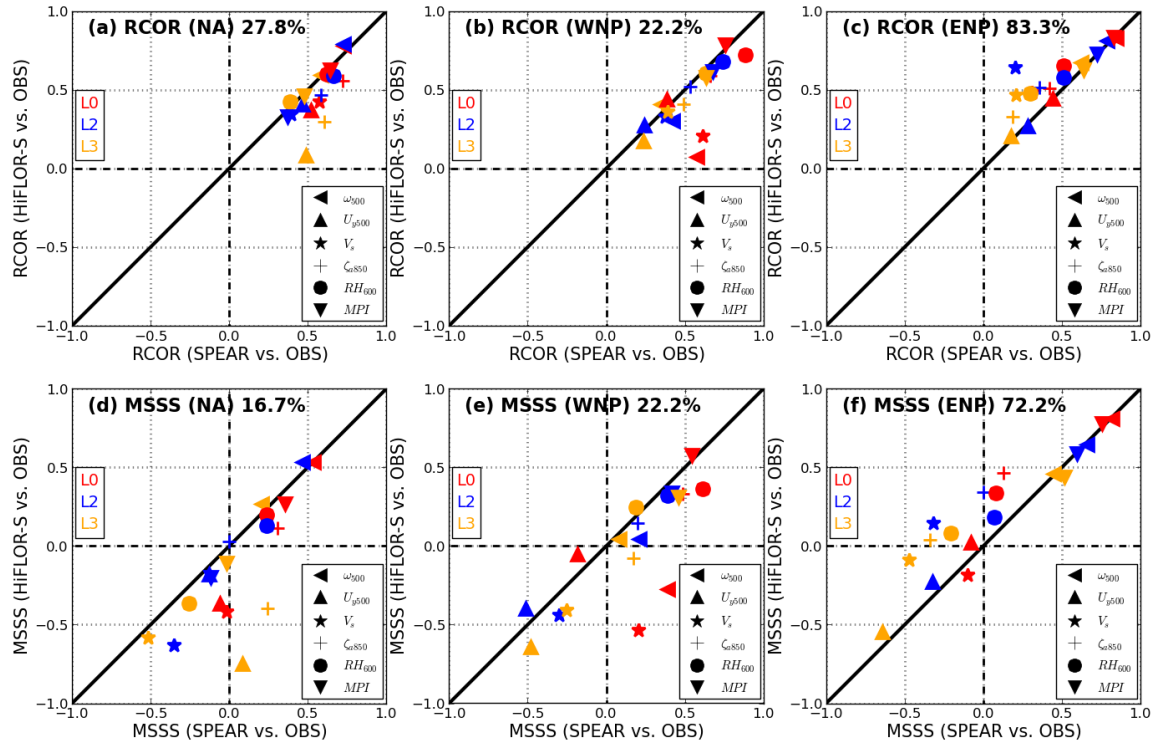
Supplementary Fig. 6 As in Fig. 6, but for HiFLOR-S and SPEAR.

(a)Observations (1992−2020, JASON)   (b)SPEAR (1992−2020, JASON, L=3)   (c) HiFLOR-S (1992−2020, JASON, L=3)

Supplementary Fig. 7 As in Fig. 7, but for SPEAR and HiFLOR-S at lead-month 3 predictions.

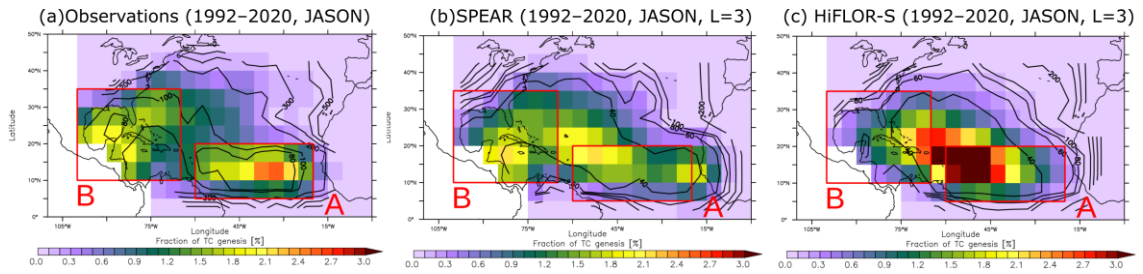**Supplementary Table 1** As in Table 2, but for SPEAR and HiFLOR-S at lead-month 3 predictions.

	Fraction of climatological mean TC genesis frequency over a domain relative to the basin-total TC genesis frequency [%]		Fraction of standard deviation of interannual variation of TC genesis frequency relative to the climatological mean TC genesis frequency [%]	
	Domain A	Domain B	Domain A	Domain B
Observations	34.2%	38.6%	81.3%	104.7%
SPEAR	28.7%	34.6%	39.0%	41.3%
HiFLOR	42.1%	28.5%	35.4%	49.3%

Supplementary Table 2 As in Table 3, but for SPEAR and HiFLOR-S at lead-month 3

predictions.

	V_s	ζ_{a850}	RH_{600}	MPI	SST
Domain A					
Observations	−0.24	+0.39	**+0.56**	+0.35	**+0.42**
SPEAR	−0.57	**+0.64**	+0.61	**+0.77**	+0.20
HiFLOR-S	−0.48	+0.35	**+0.84**	**+0.79**	+0.36
Domain B					
Observations	**−0.43**	**+0.54**	−0.11	−0.22	+0.00
SPEAR	−0.54	**+0.88**	**+0.60**	−0.48	+0.01
HiFLOR-S	**−0.42**	**+0.75**	−0.24	−0.22	+0.22