



中央氣象局第二代全球動力氣候預報系統之測試與建置

氣候預報系統發展小組

中央氣象局

氣象科技研究中心

報告人

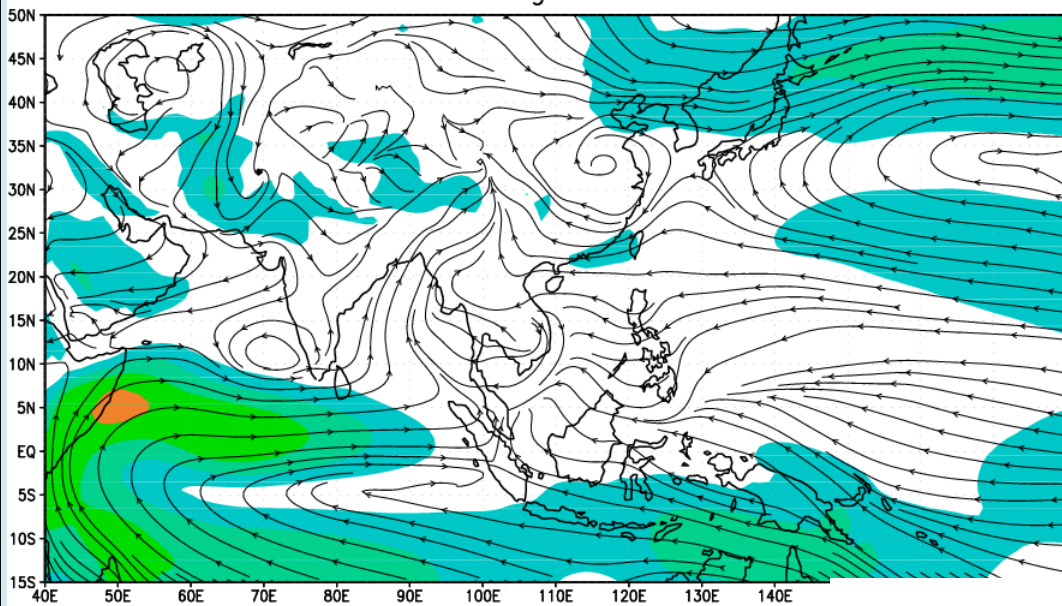
胡志文



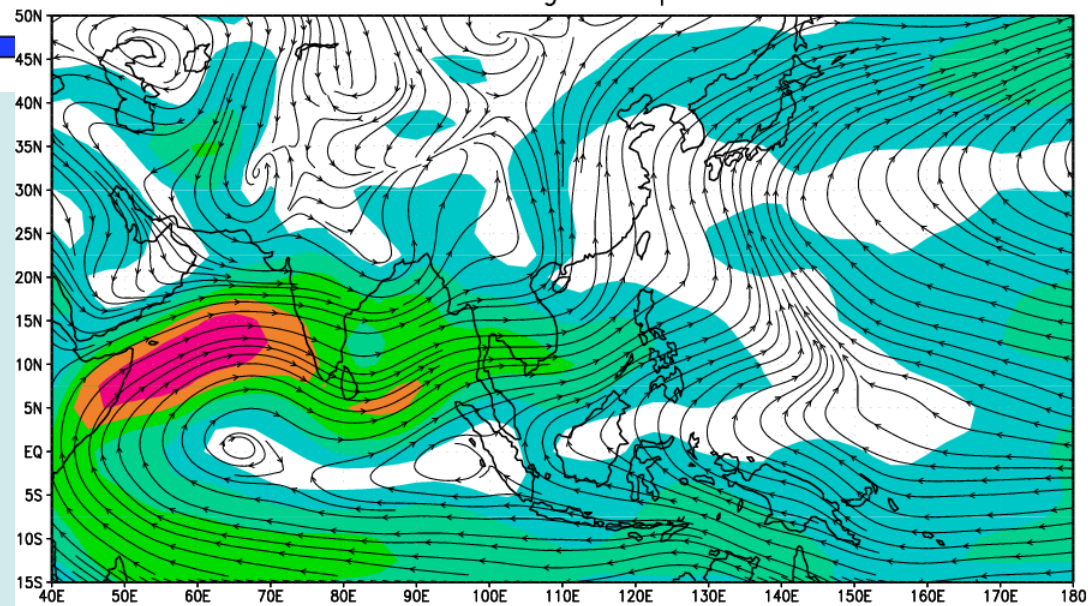
	T119L40 (二代模式, NWP 2009)	T42L18 (一代模式)
解析度	1 X 1 (垂直方向40層)	2.8125 X 2.8125 (垂直方向18層)
輻射參數化	Unified two-stream calculation with K-correlated method (Fu and Liou 1992,1993; Fu et al. 1997)	Harshvardihan et al (1987)
積雲參數化	Simplified Arakawa-Schubert (Pan and Wu 1994)	Relax Arakawa-schubert (Moothi and Suarez 1992)
大尺度降水	Predict cloud water scheme (Zhao and Frederick 1997)	以相對溼度區分
淺積雲降水	Li and Yound (1993)	Li (1994)
垂直渦流混合	First-order nonlocal scheme (Troen and Mahrt 1986)	TKE-ε scheme (Detering and Etling 1985)
地面通量	Similarity theory (Businger 1971)	Similarity theory (Businger 1971)
陸地模式	Two layer soil model (Mahrt and Pan 1984)	Bucket method (Manebe 1969)
重力波阻	Palmer et al. (19886)	Palmer et al. (19886)



T119L40 Aug 850hPa Wind

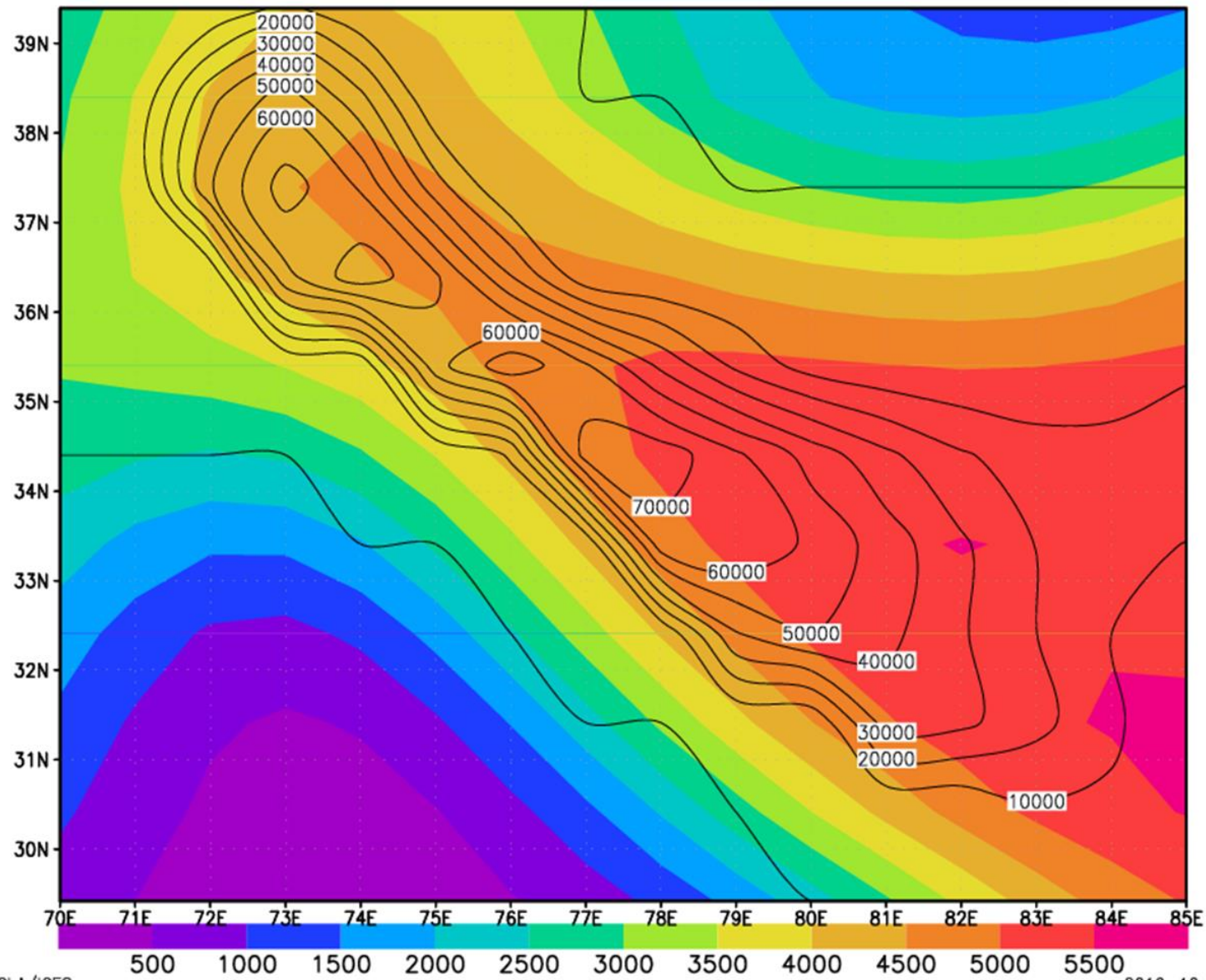


NCEPRA1 Aug 850hpa Wind



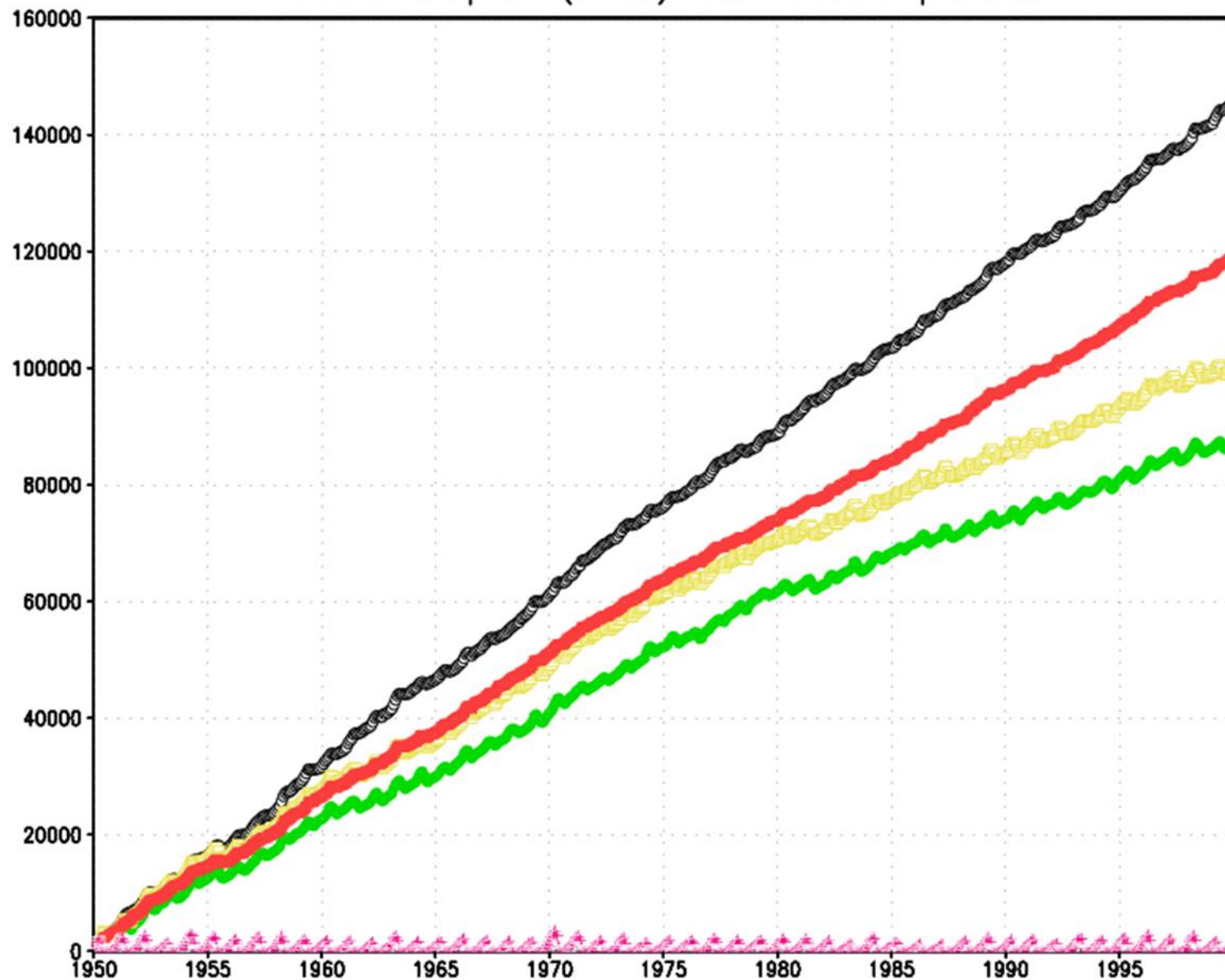


Snow Depth (mm) Summer Climatology & Topography

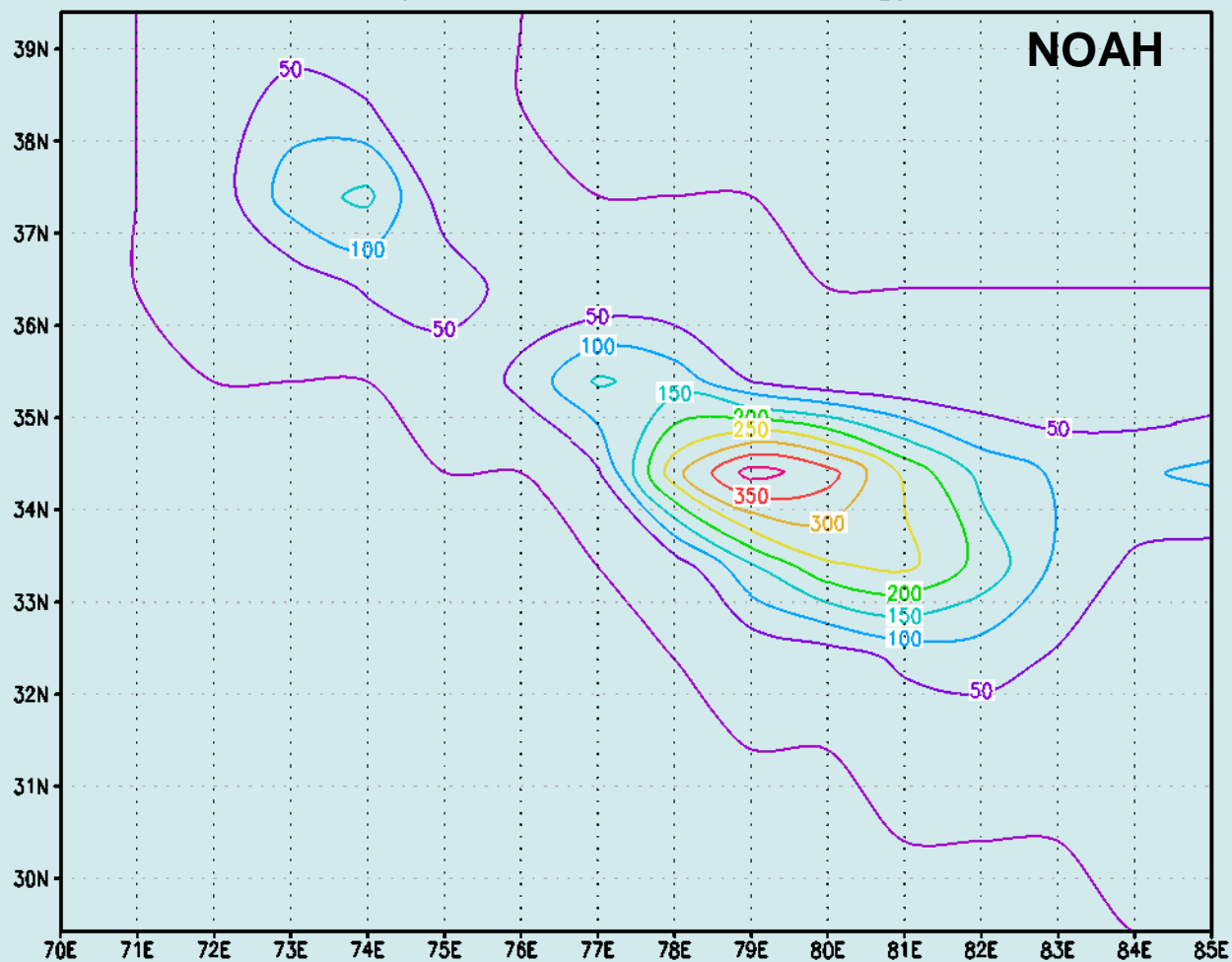




Snow Depth (mm) for some points



Snow Depth Summer Climatology NOAA

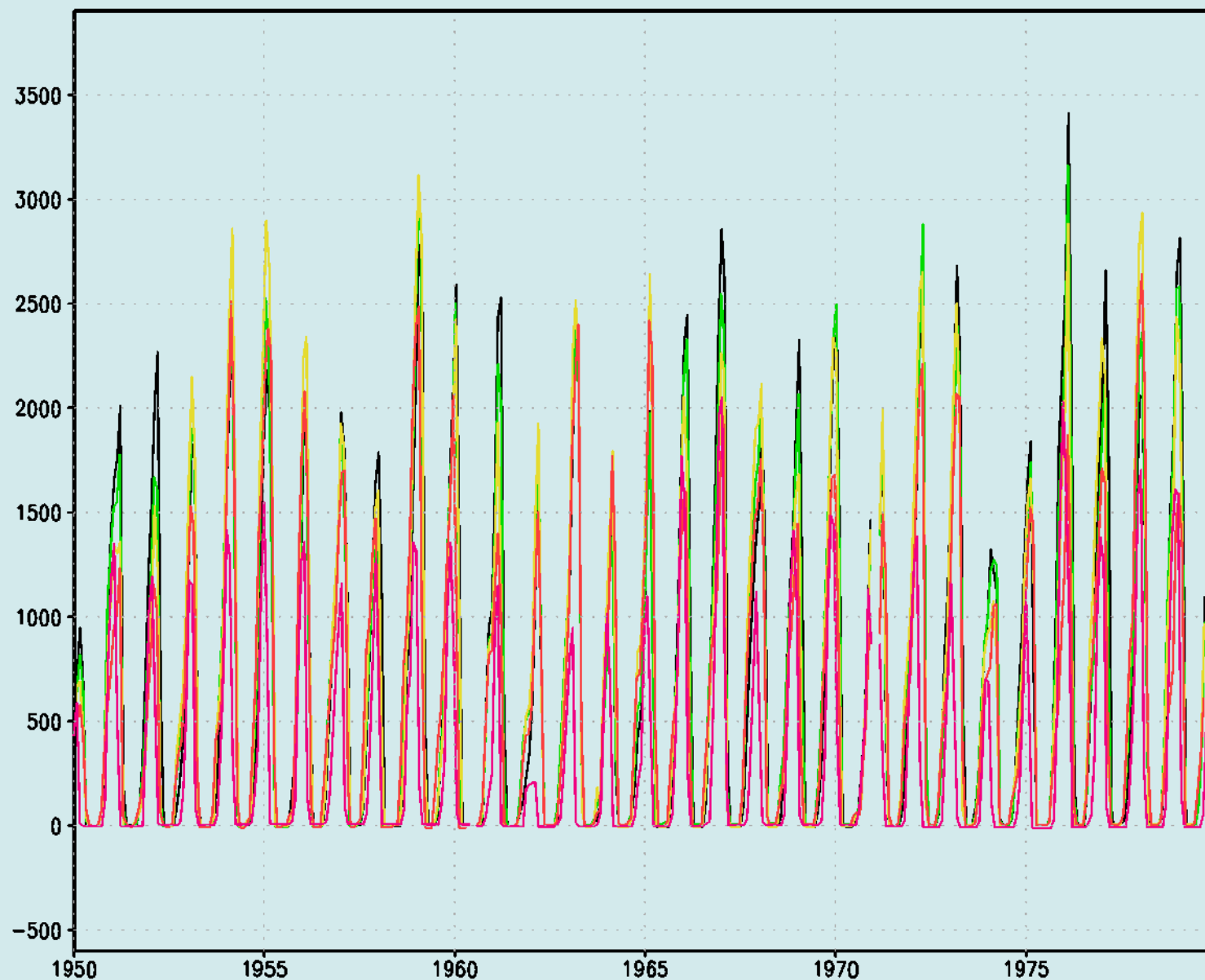


GrADS: COLA/IGES

2011-05-17-10:25

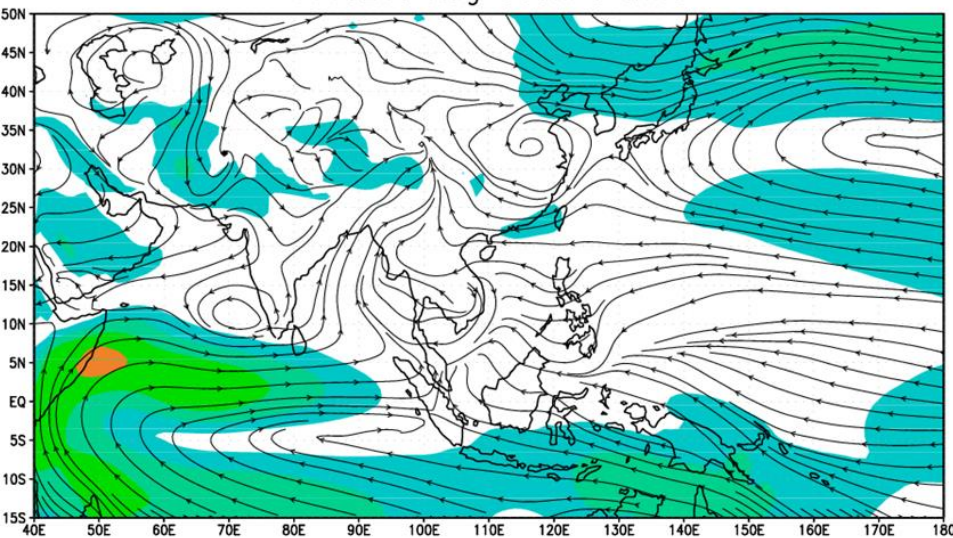


Snow Depth for some points

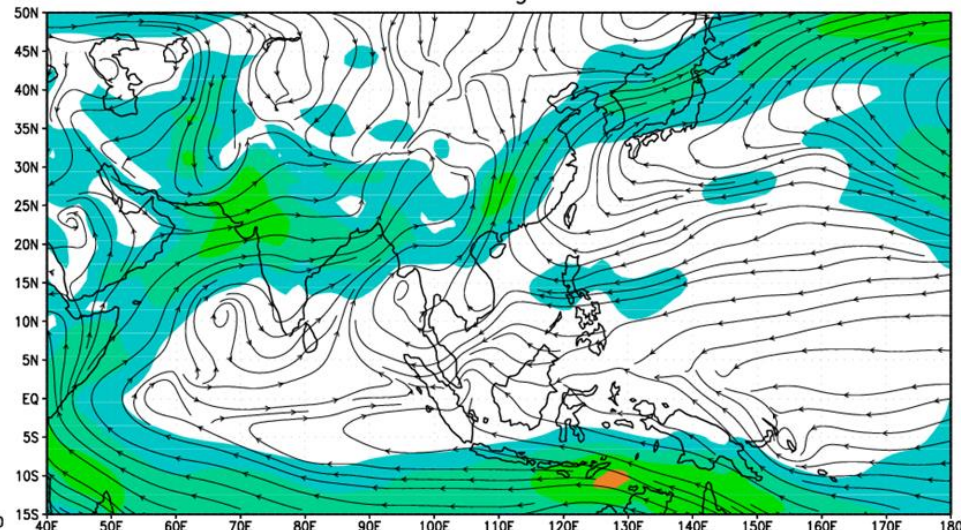




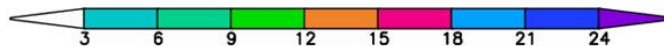
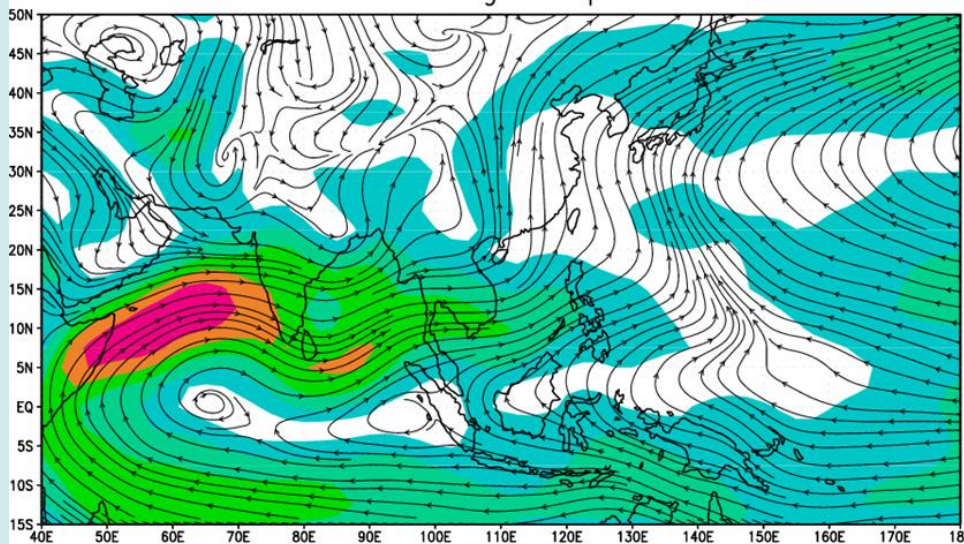
T119L40 Aug 850hPa Wind



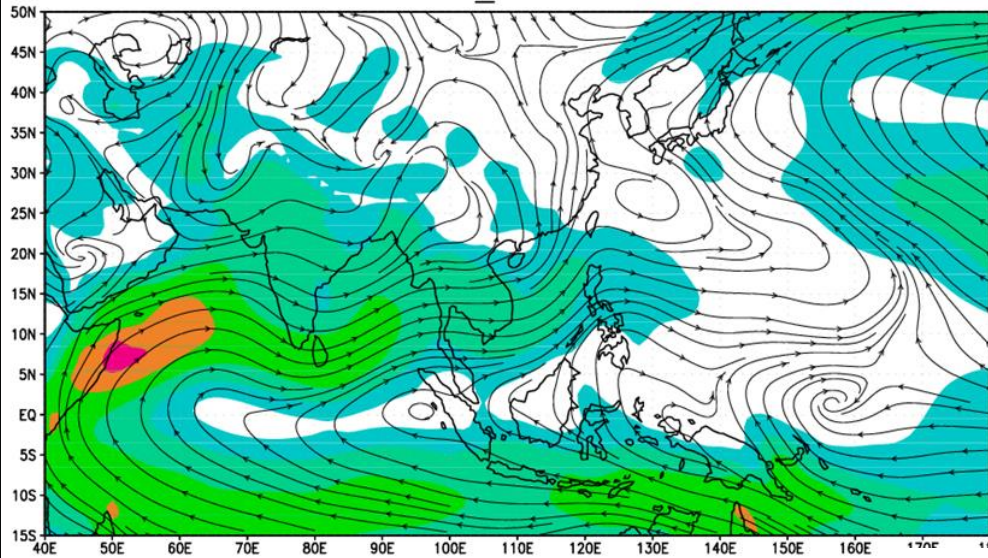
T119L40NOAH Aug 850hPa Wind



NCEPRA1 Aug 850hpa Wind

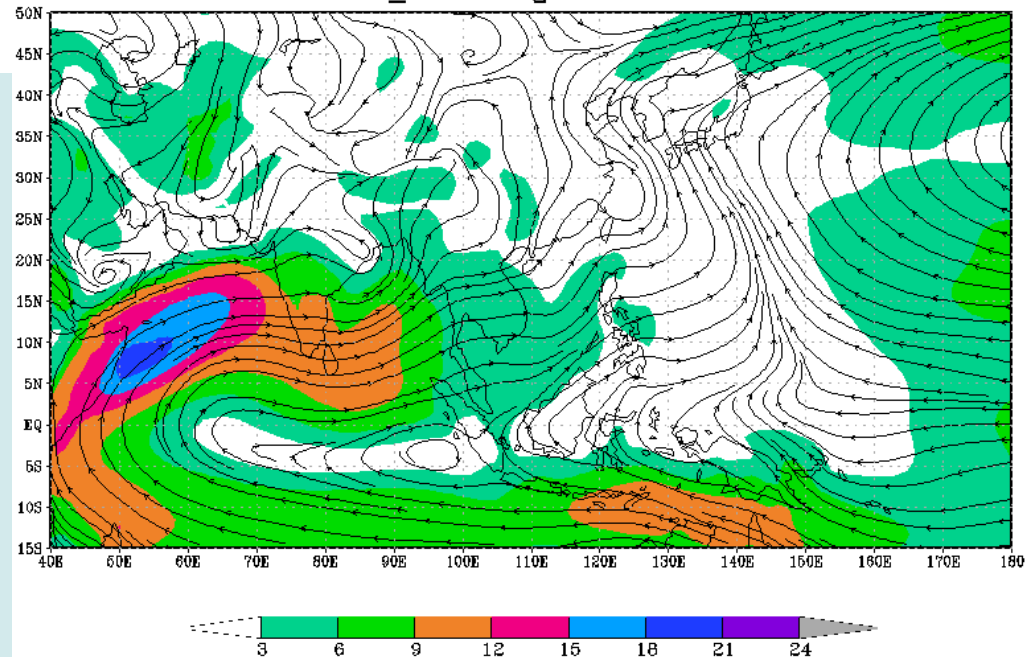


T119L40NOAH_RAS 850hPa Wind

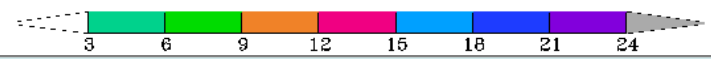
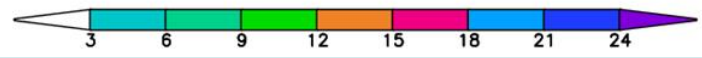


RAS

t119140_NAOH Aug 850hPa Wind



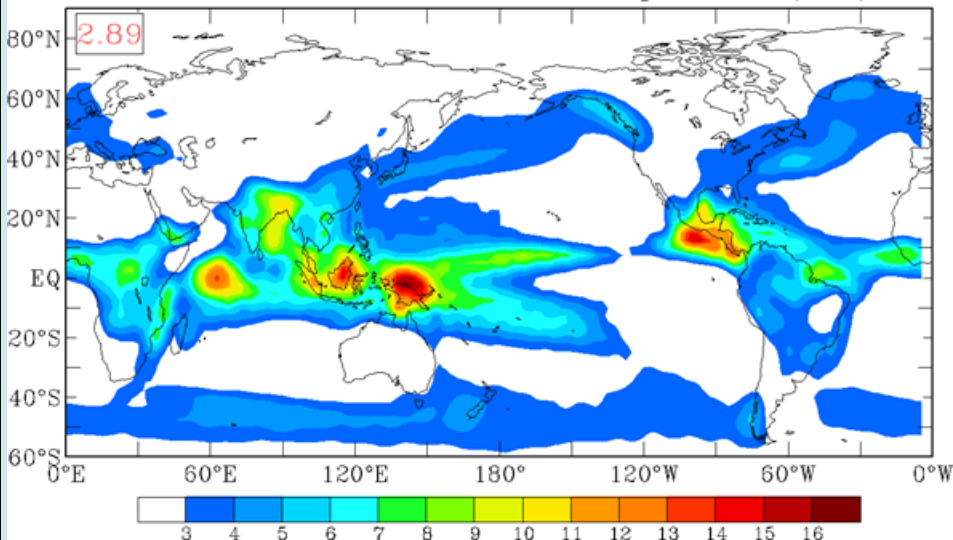
New SAS



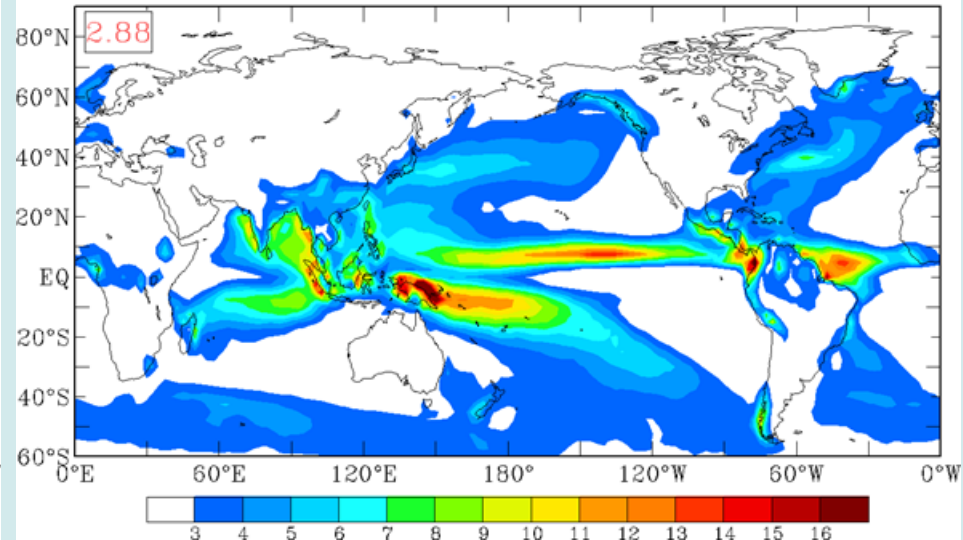


Annual Mean Precipitation

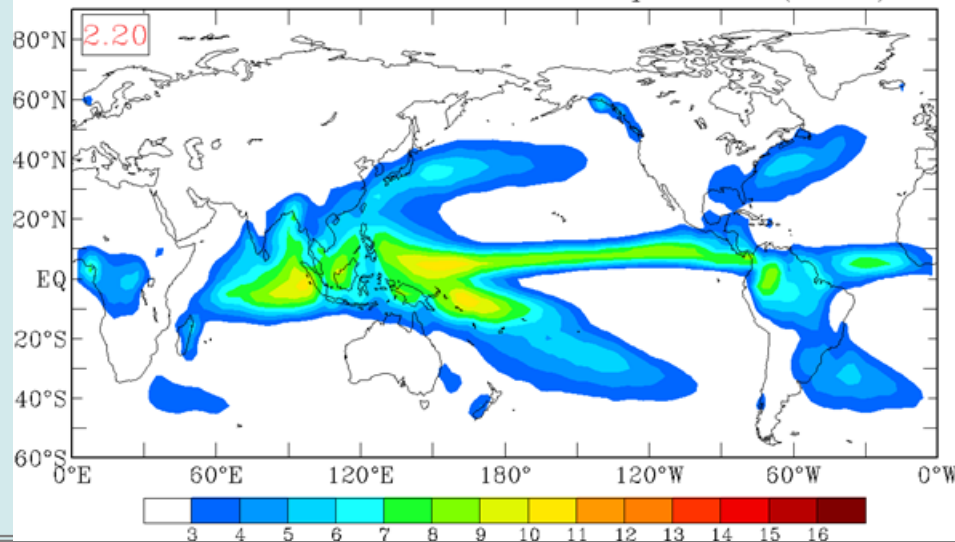
1979-2005 Annual Mean Precipitation (T42)

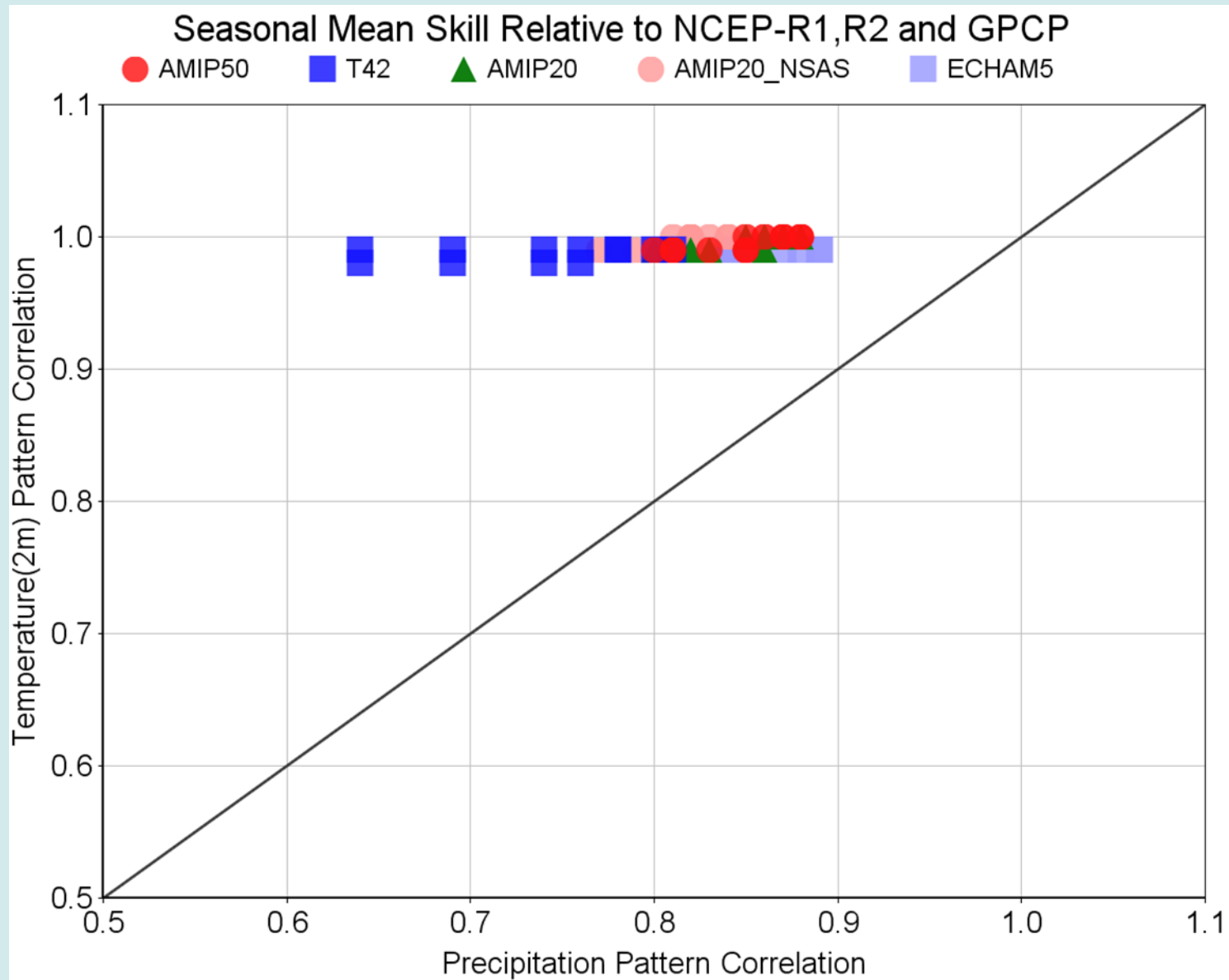


1991-2010 Annual Mean Precipitation (AMIP20_NSAS)



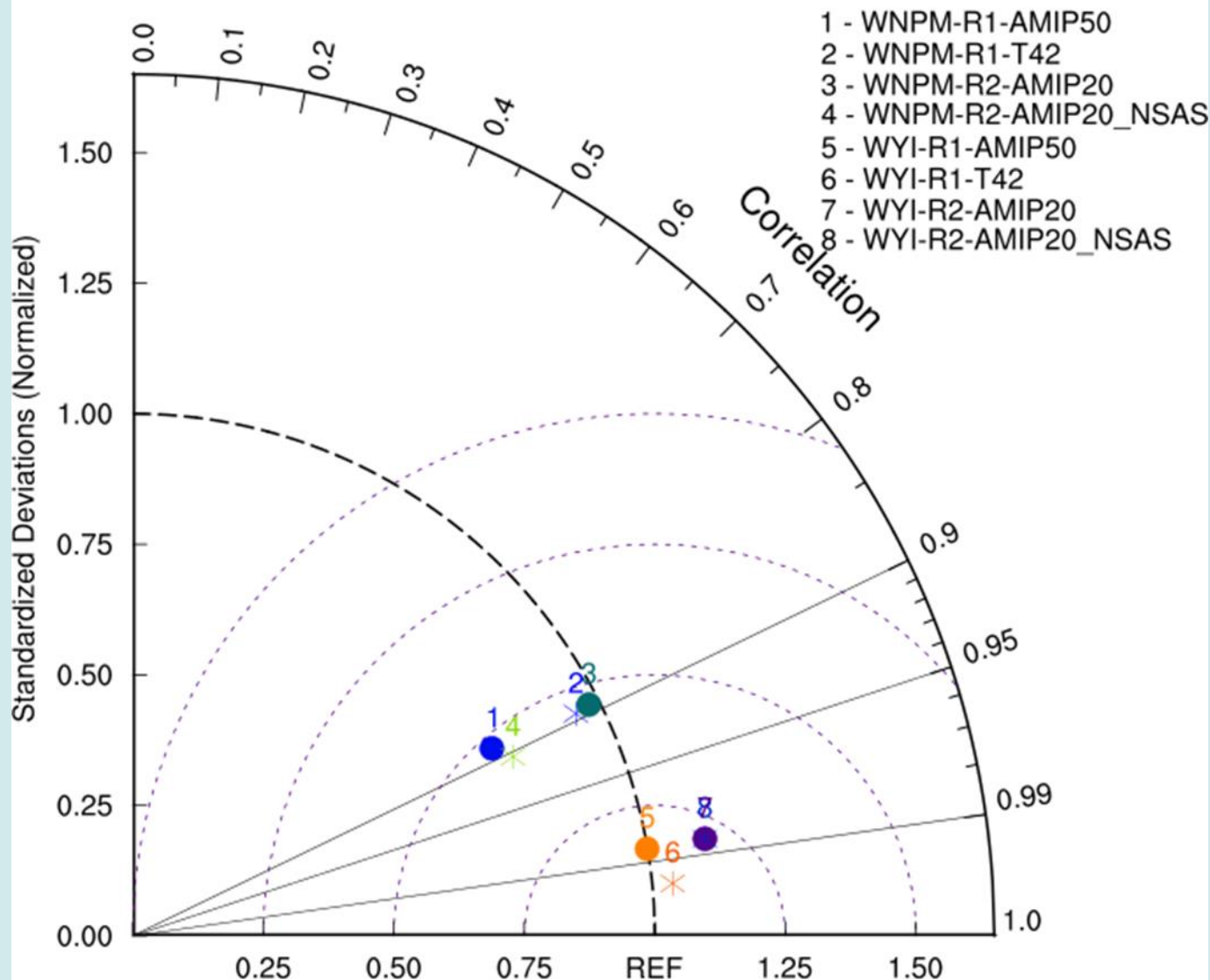
1991-2010 Annual Mean Precipitation (CMAP)

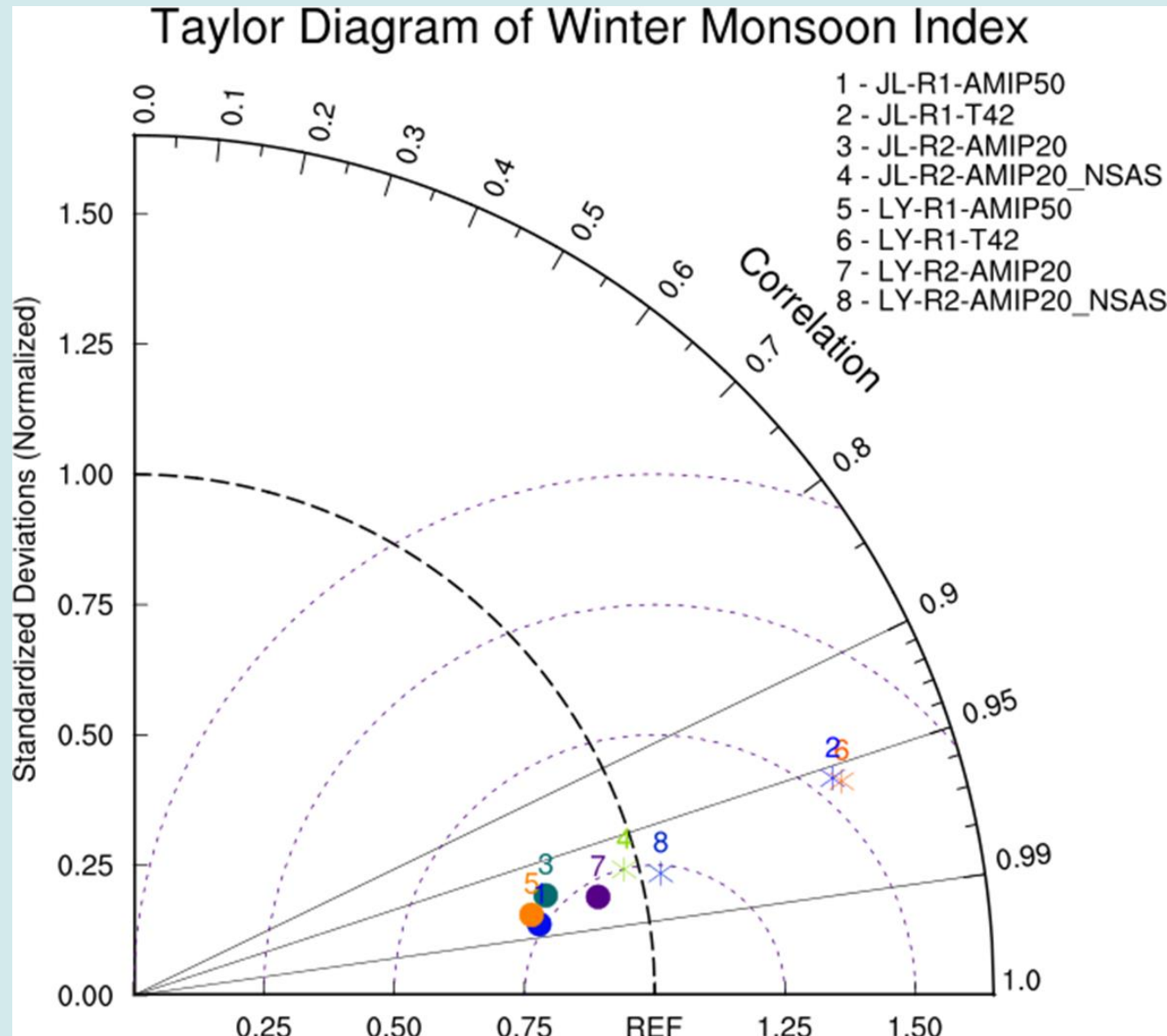


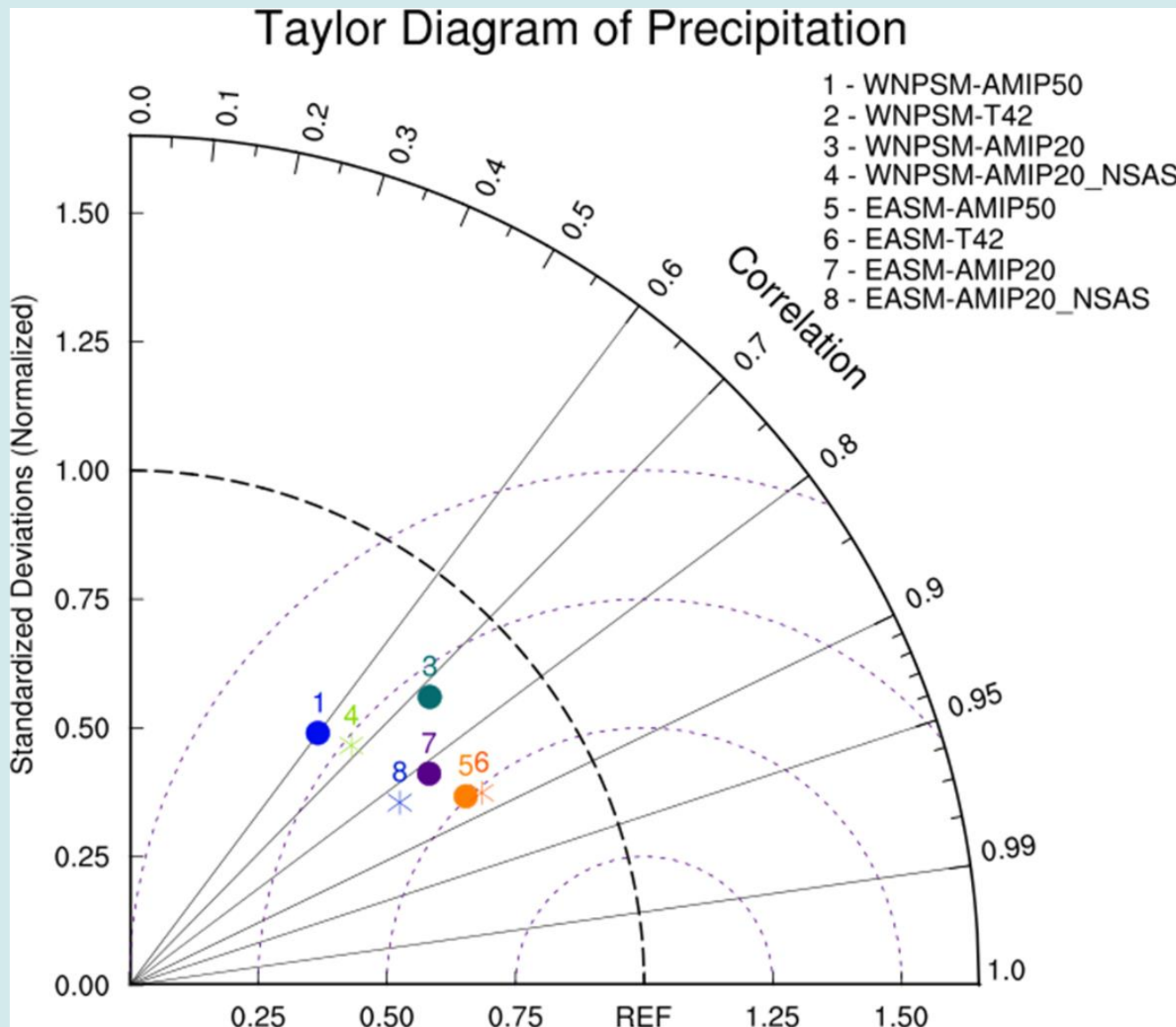


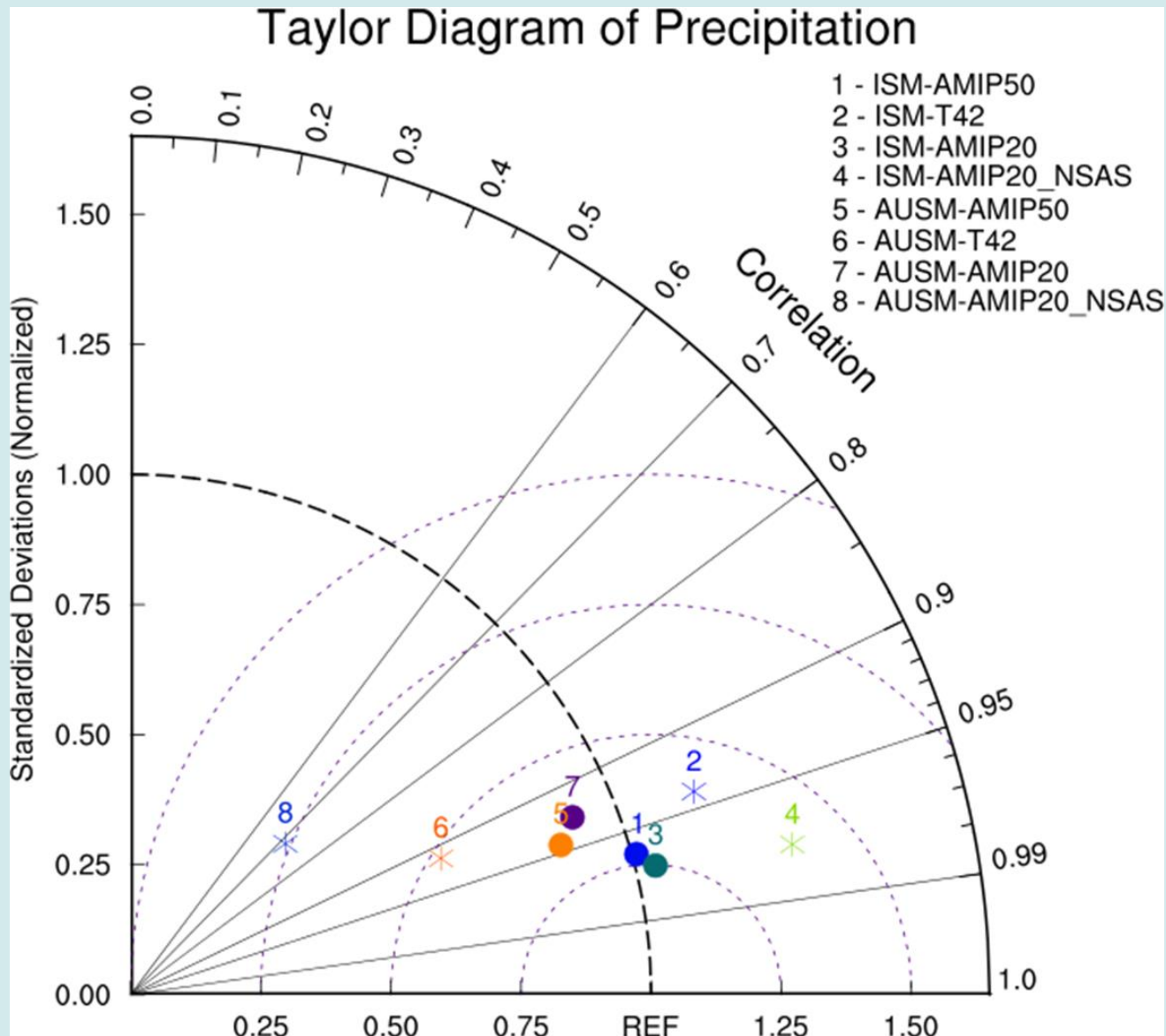


Taylor Diagram of Summer Monsoon Index

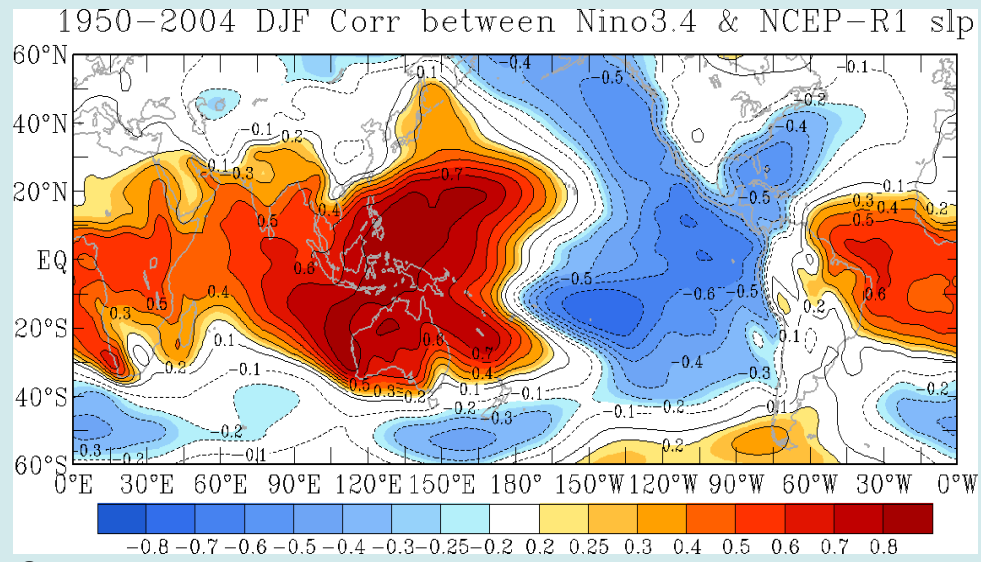




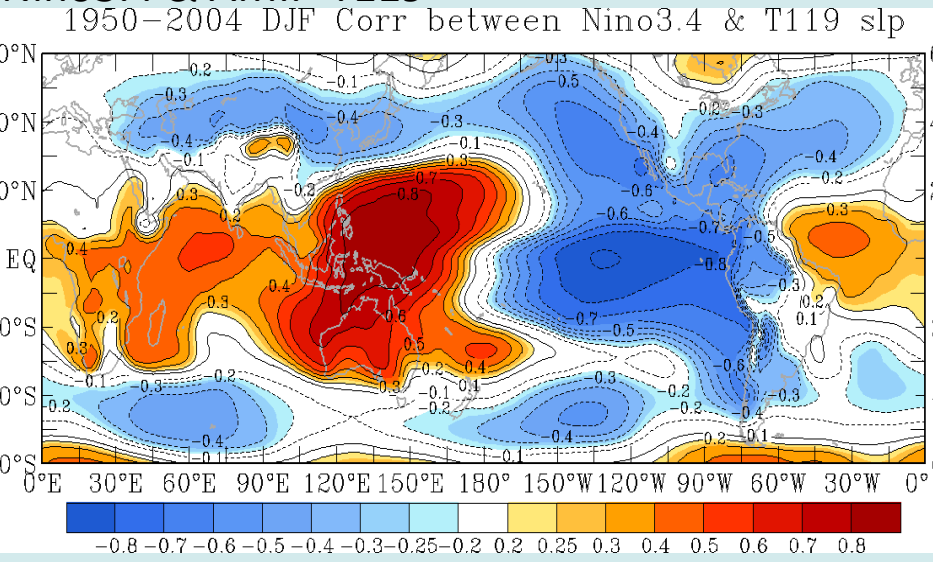




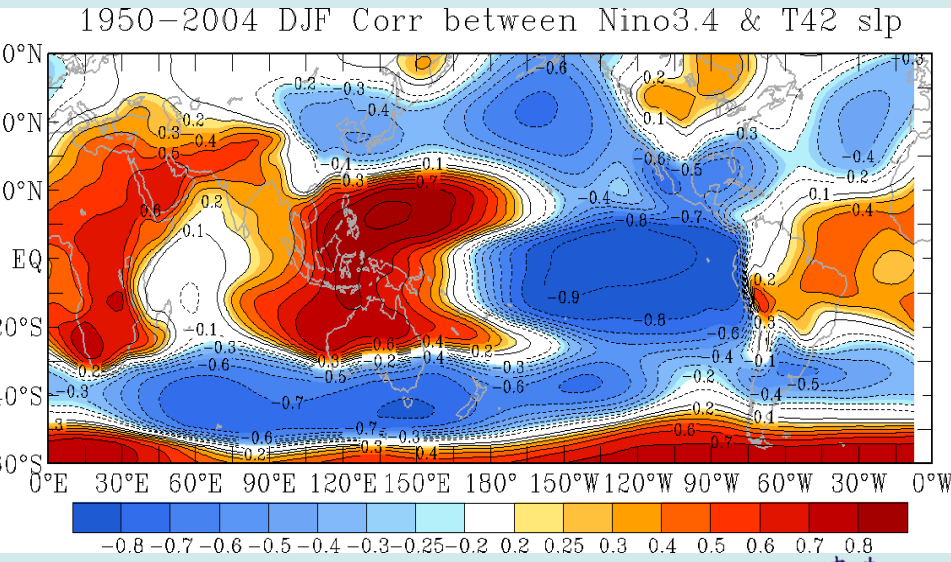
Nino3.4 & NCEP-R1



Nino3.4 & AMIP-T119

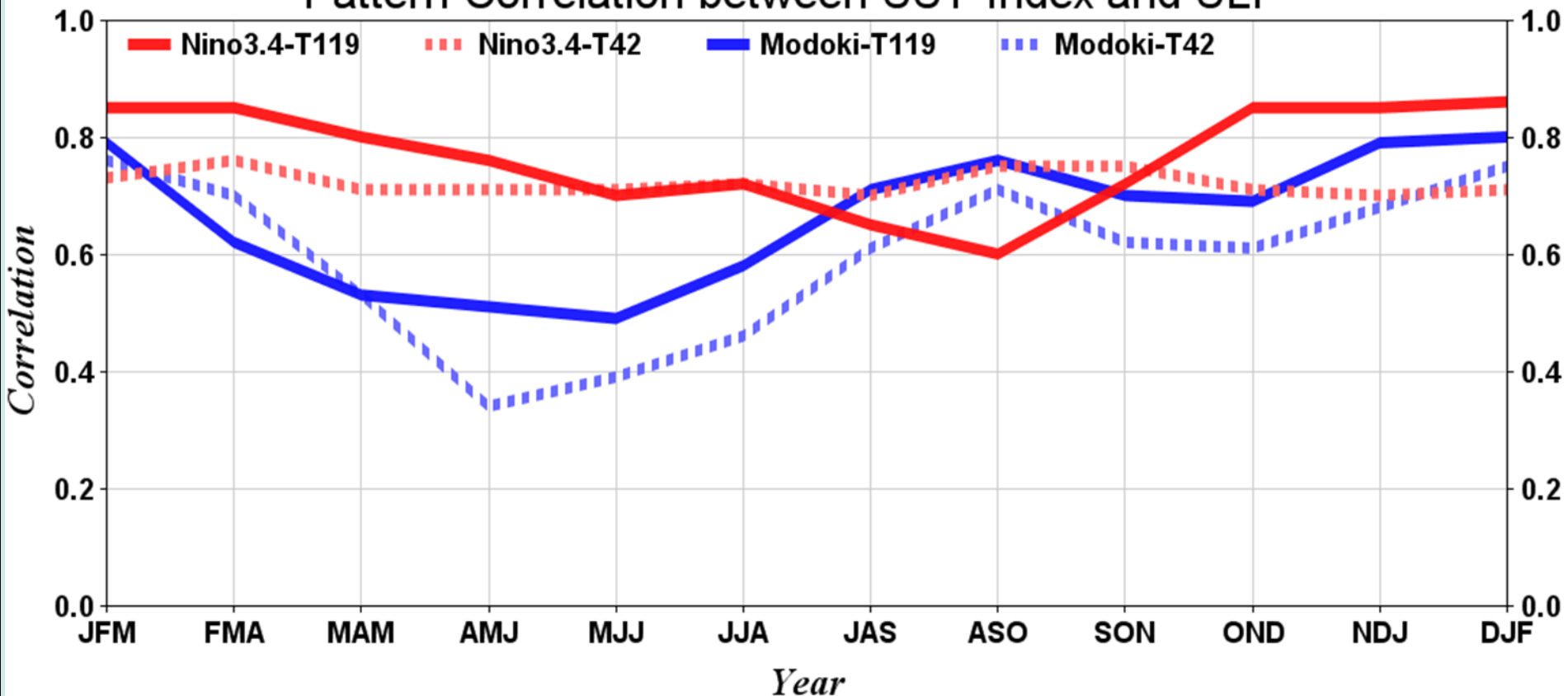


Nino3.4 & AMIP-T42





Pattern Correlation between SST-Index and SLP





◎ SLP Pattern Correlation between AMIP-T119 and NCEP-R1

	IOD	NinoWest	Nino4	Nino3.4	Nino3	Nino1+2	Modoki
JFM	0.33	0.73	0.83	0.85	0.84	0.75	0.79
FMA	0.62	0.61	0.82	0.85	0.84	0.75	0.62
MAM	0.34	0.4	0.77	0.8	0.76	0.74	0.53
AMJ	0.26	0.18	0.73	0.76	0.74	0.77	0.51
MJJ	0.42	0.17	0.65	0.7	0.65	0.65	0.49
JJA	0.57	0.36	0.6	0.72	0.66	0.62	0.58
JAS	0.54	0.53	0.54	0.65	0.6	0.49	0.71
ASO	0.45	0.55	0.51	0.6	0.56	0.48	0.76
SON	0.49	0.55	0.68	0.72	0.69	0.6	0.7
OND	0.69	0.54	0.83	0.85	0.84	0.78	0.69
NDJ	0.57	0.64	0.84	0.85	0.85	0.81	0.79
DJF	0.24	0.72	0.85	0.86	0.85	0.8	0.8

● T119能掌握住各海溫指標反應大氣環流特徵，但夏季模擬較差。



Summary

- 第二代全球動力氣候預報模式已於2012年完成測試與建置。
- 一般而言，二代模式不論在年週期或年際變化的模擬結果都較一代模式為佳。但在季風指標與雨量方面，兩代模式各有優劣。
- 目前正在進行二代模式1982-2011年的重新預報，依目前資源用64個cores同時執行12組預報，約需2年時間。
- 將數值天氣預報模式用在氣候預報前，必須先進行充分的測試。