

Decadal Change in East Asian Monsoon Climate System: Natural Variability vs Anthropogenic Forcing

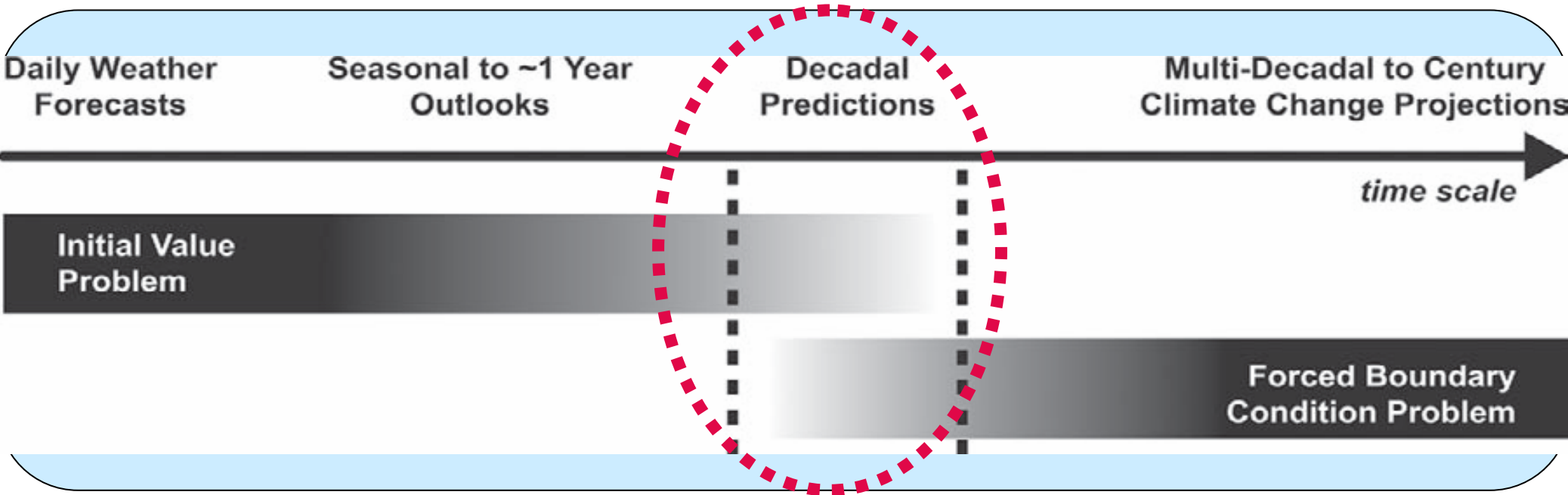
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Why emphasize the decadal change?

Natural signature vs. anthropogenic forcing

Meehl, et al. BAMS, 2009



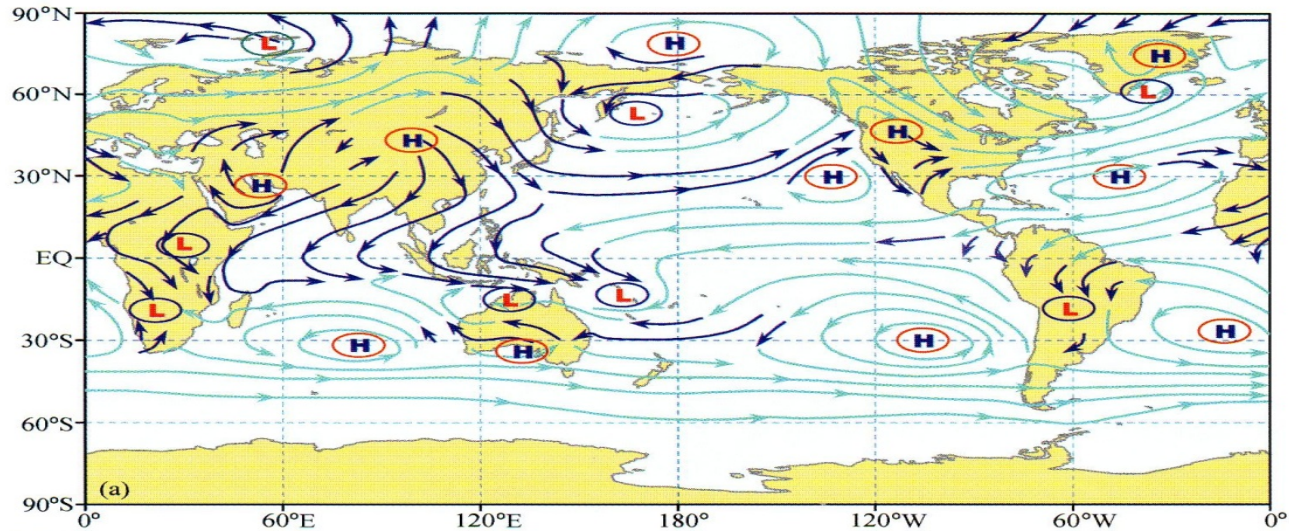
Schematic illustrating progression from initial value problems with daily weather forecasts at one end, and multidecadal to century projections as a forced boundary condition problem at the other, with seasonal and decadal prediction in between

Issues

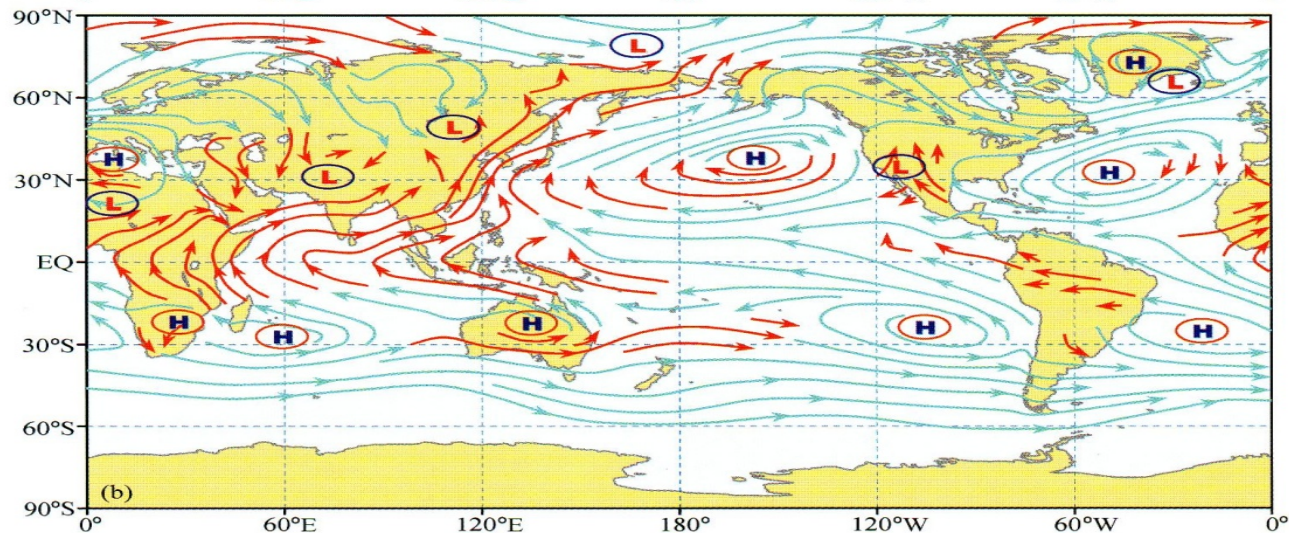
- ◆ **What is the observed decadal change in East Asian monsoon climate system ?**
- ◆ **Can such a decadal change be considered as natural variability (say, the PDO's impact)?**
- ◆ **What is the role of increased CO₂ and aerosols?**
- ◆ **Summary**

Climatological East Asian Summer Monsoon

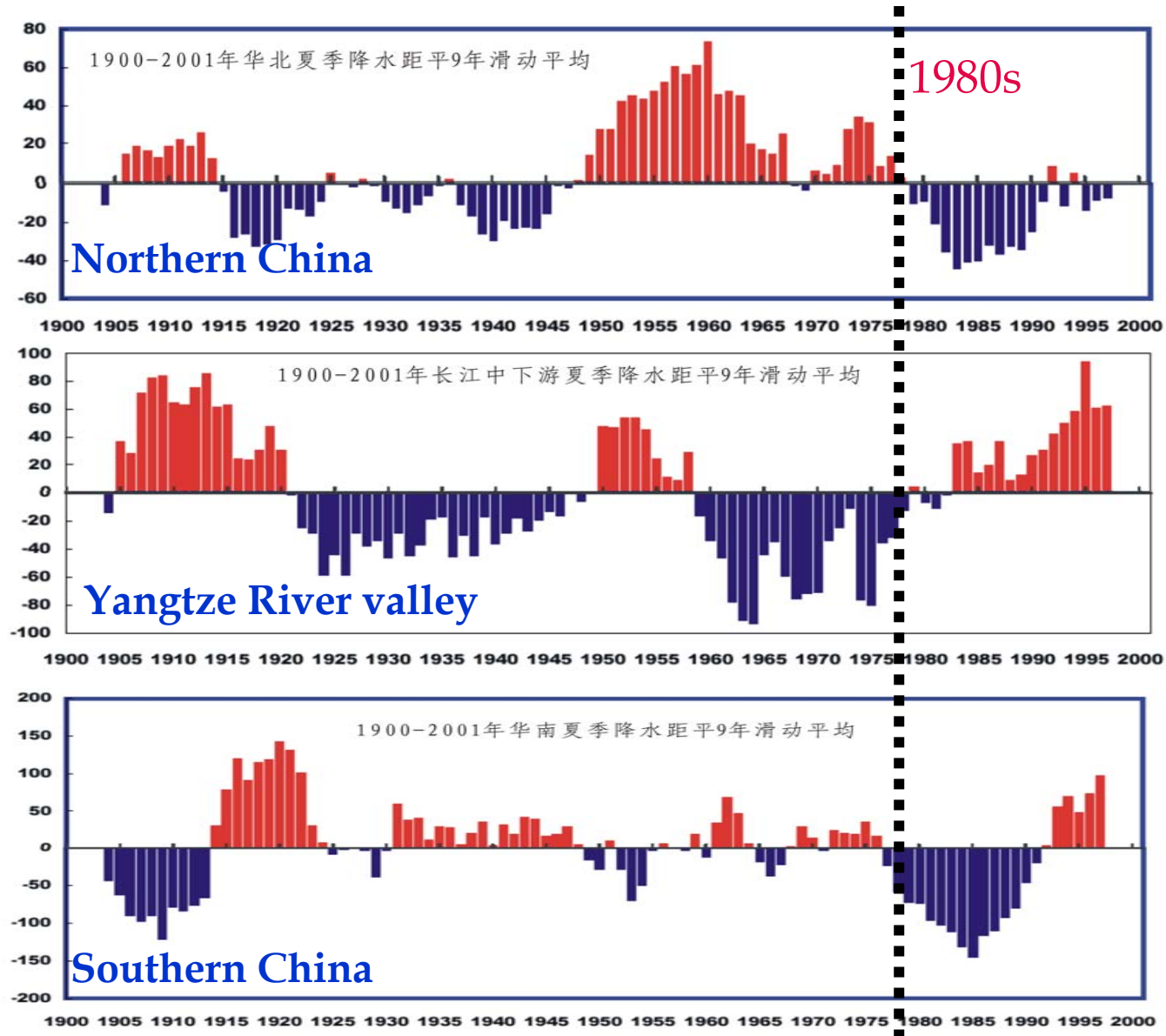
Winter
(DJF)



Summer
(JJA)



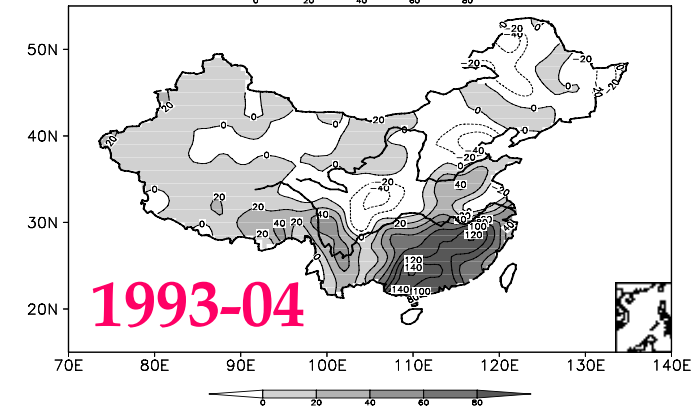
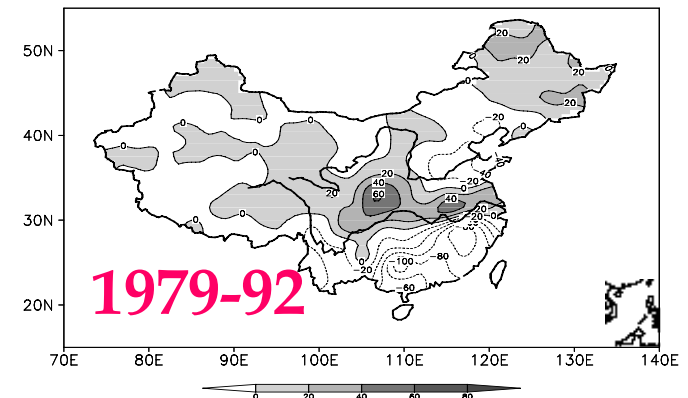
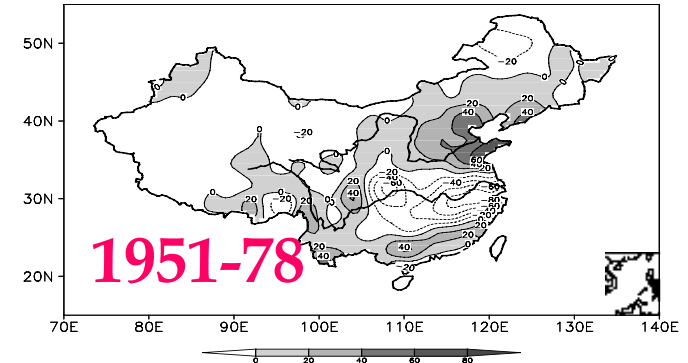
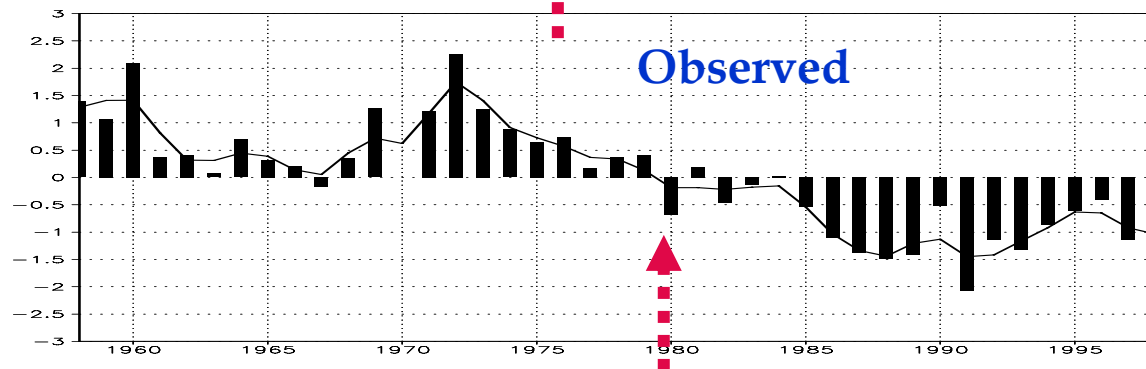
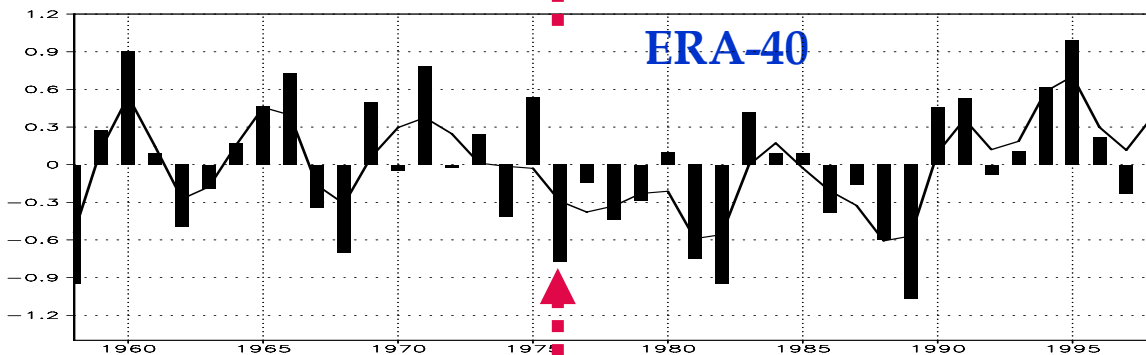
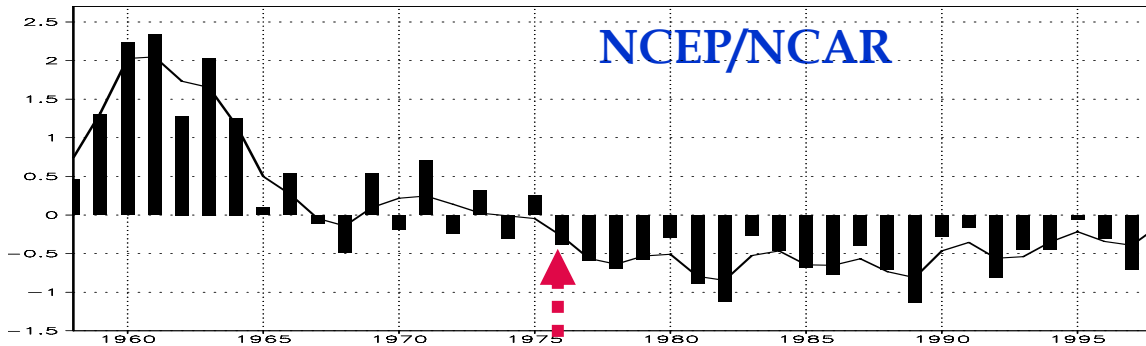
Interdecadal variabilities of 9-yr running averaged precipitation in eastern China since 1900



Sun, 2006

Decadal weakening of East Asian summer monsoon and southward shift of rainbelt in China

EASM Index: Standardized 850hPa and surface v-component (110 °- 125 °E, 20 °- 40 °N)



Decadal change of EASM rainfall (1948-2004) over whole East Asian domain

Post-1976 minus Pre-1976

