Geophysical Research Abstracts, Vol. 7, 09714, 2005
SRef-ID: 1607-7962/gra/EGU05-A-09714

High and Low Transient Activity over the North Pacific and Eurasian Climate Change: Observations and Modeling

A. Favre (1), A. Gershunov (2) and H. Douville (3)

(1) Université Lyon 3, (2) Scripps Institution of Oceanography , (3) CNRM, Météo-France

Applying a new automated method to track synoptic transient high and low pressure systems, we compute a 50-year climatology of cyclonic and anticyclonic activity over North-eastern Eurasia and the North Pacific basin from daily mean sea level pressure data in the NCEP/NCAR reanalysis. It is shown that Eastern and Western Pacific wintertime transient activity displays an out-of-phase interaction with stronger (weaker) cyclonic (anticyclonic) activity in the western (eastern) North Pacific before (after) the late 1970s. Some climatological characteristics of synoptic transients show a discrete shift in the late seventies, while others show a strong linear trend between 1950 and 2000. Notably, the central pressure of anticyclones shows a clear linear decrease throughout the North Pacific basin during the last half century. We attempt to explain part of this observed behavior by relating it to temperature and snow cover variations over a major anticyclone generation region in eastern Eurasia available from in situ observations and satellite remote sensing. Finally, we will compare the observed relationships to those produced by the CNRM coupled GCM (CGCM). Northern Eurasia shows the biggest anthropogenic climate change signal observed anywhere on Earth. If the CGCM is deemed able to produce realistic North Pacific transient behavior and relationships to Eurasian temperature and snow cover, it will be used to project anthropogenically forced changes in North Pacific synoptic transient activity into the second half of the 21st century.