CNRM, UMR 3589

SEMINAIRE CNRM

N° 2016_19

lundi 14 novembre 2016 à 10h30

DISENTANGLING NATURAL AND ANTHROPOGENIC CONTROLS ON TERRESTRIAL EVAPOTRANSPIRATION AND VEGETATION GROWTH TRENDS

par Jiafu MAO

(Oak Ridge National Lab, USA)

en salle Joël Noilhan

Abstract :

Two recent studies on how natural and anthropogenic forcings influenced the global land evapotranspiration (ET) and the northern-extratropical latitudes (NEL) vegetation growth will be presented.

During 1982-2011, the climate impacts were characterized to determine the spatiotemporal variations in ET. Globally, rising CO_2 ranked second after the predominant climatic influences, and yielded decreasing trends in canopy transpiration and ET, especially for tropical forests and high-latitude shrub land. Increasing nitrogen deposition slightly amplified global ET via enhanced plant growth. Land-use-induced ET responses, albeit with substantial uncertainties across the factorial analysis, were minor globally, but pronounced locally, particularly over regions with intensive land-cover changes. This ET study highlights the importance of employing multi-stream ET and ET-component estimates to quantify the strengthening anthropogenic fingerprint in the global hydrologic cycle.

We used multiple estimates from remote sensing-based datasets and simulations from earth system models, and one statistical framework to attribute the enhanced vegetation growth in the northern-extratropical latitudes during the past three decades. Our findings reveal that the observed vegetation activity is consistent with the simulations with anthropogenic forcings, where the greenhouse gases forcing plays a dominant role, but not with that expected from internal climate variability and natural forcings only. This study provides clear evidence of a discernible human fingerprint on large-scale terrestrial vegetation dynamics.

Pour tout renseignement, contacter Y. Poirier (05 61 07 96 55) ou J.L. Sportouch (05 61 07 93 63)
Centre National de Recherches Météorologiques
42, Avenue G. Coriolis - 31057 Toulouse Cedex