

Impact of irrigation over India on the land-surface fluxes

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Irrigation is the main water user in the world with 87 % of the global water consumption being attributed to use on irrigated crop land. There are large spatial variations of the irrigated areas, from 68 % in Asia and 16 % in America, 10 % in Europe and the remaining in Africa and Australia. India is the most important irrigating country in the world with a gross irrigation requirement estimated by the FAO at 457 cubic km by year.

The environmental impacts of irrigation are very important: irrigation causes the soil salinization, it affects the water quality and ecology, and increases the incidence of water related diseases. Irrigation is also expected to affect the the land surface energy budget, and thereby the climate system.

The work presented here is conducted in the framework of the PROMISE European project. It aims to analyze the sensitivity of the land surface fluxes to the intensive irrigation over Indian peninsula. Numerical experiments are conducted with the land surface scheme ORCHIDEE of the Laboratoire de Meteorologie Dynamique, with a 1 degree spatial resolution. Two 2years simulations, forced by the ISLSCP (1987-88) data sets, are compared, with and without irrigation. The analysis focuses on the effect of land irrigation on the surface fluxes (partition of energy between latent and sensible fluxes), and the river flow.

Wednesday IV (Talk)