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Biennial oscillation of Indian summer monsoon and northern hemisphere surface climate at the turn of the century.

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The year-to-year variability of monsoon has large impacts on the people living in Asia. The tendency for a wet Indian summer monsoon to be followed by a dry monsoon is a part of the distinct biennial variability of tropical climate. The tropospheric biennial oscillation is thought to arise from air-sea interaction over the Indian and Pacific oceans, but its relation to extratropical climate is not well understood. In this study we find that tropical Atlantic Ocean and Arctic oscillation exhibits a biennial oscillation related to monsoon. Century long records show that the biennial oscillations of Indo-west Pacific summer monsoon rainfall and winter Arctic Oscillation occurs in multi-year bursts and coincides intermittently. Daily satellite data shows a coherent evolution of northern hemisphere surface climate during the recent biennial episode of 1999-2005. During this period a warm and wet summer of Indo-west Pacific region is followed by a higher winter AO signal. This results in a strengthening of subpolar westerlies and hence a warm temperature over Asia during winter. The intertropical convergence zone over the central Pacific and Atlantic Oceans shift north by about two degrees when the northern hemisphere is warm. We propose that the reorganization of subseasonal tropical convection is responsible for the connection of tropics with extra-tropics during this period.