



Cause of the Interannual Variation of Boreal–Forest Fires

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The boreal-forest rainbelts are maintained by transient disturbances ahead of subarctic troughs over Central Asia, the Bering Sea, and the Labrador Sea (Yoon and Chen 2006). The interannual variation of the subarctic circulation is reflected by the filling/deepening of these troughs. The response to this subarctic circulation variation is the reduction (enhancement) of rainfall along boreal forests. Thus, the consequence of this annual variation in boreal-forest rainbelts should be reflected by the increase (decrease) of forest fires along the boreal forests over Siberia and the Alaska-Mackenzie River basin, because of the lack (oversupply) of water vapor to maintain boreal-forest rainbelts. The forest fire data issued by several sources including Russia Federal Forest Agency, U.S. Alaska Fire Service, Canadian Wildland Fire Information System, and the Worldfire data from European Space Agency Earth Resource Satellite-2 over the period of 1960-2009 were used to compile/analyze the interannual variation of forest fires along the boreal forests of two continents. The rainfall data of GPCP and GHCN, the re-analysis data of ERA-40 and GEOS-5, and the initial analysis of NCEP GFS were employed to identify/depict the interannual variation of the subarctic summer circulation and the maintenance of boreal-forest rainbelts. The consistency of interannual variations between the occurrence frequency of forest fires and the subarctic circulation/boreal-forest rainbelts confirms our argument about the cause of the interannual variation in the boreal forest fires.