

3.环境变化与人地关系历史

帕米尔高原冬春季降水的水汽来源及影响机制

毛兴莉、邢莉、段克勤、尚澈、李双双

陕西师范大学

摘要: The abundant precipitation over Pamirs Plateau (PP) in spring and winter plays a vital role in the water resources over the arid areas of Central Asia. Understanding the moisture sources and water vapour transportation associated with precipitation are very important, but there were few studies investigating the moisture sources of PP. We used a Lagrangian model driven with the Weather Research and Forecasting output to analyse the moisture sources at Northern Pamirs Plateau (NPP) and Southern Pamirs Plateau (SPP) in spring 2016, 2009 and 2001, and in winter 2016, 2010 and 2017, as the seasonal precipitation in PP was the largest, median and lowest during 2001 to 2018, and the precipitation in spring and winter was much higher than that in summer and autumn. The moisture sources from four regions were quantified: Atlantic-Europe-Africa, Arctic-Northern Asia, Indian Ocean, and moisture recycling from the PP. Atlantic-Europe-Africa and Indian Ocean are the dominant moisture source regions in spring and winter, which contribute more than 70% to the total moisture affecting the precipitation at PP. The contributions of Indian Ocean are higher at SPP than those at NPP in spring and winter. The contributions from Arctic-Northern Asia and PP are generally low, except that the moisture from PP region contributed 19% to the spring precipitation at NPP, indicating the importance of a local moisture source in enhancing the spring precipitation at NPP. The moisture contributions originating from the different source regions show great differences between winter and spring. The moisture transportation is affected by westerlies, and the zonal winds in spring affect the moisture transportation, while the meridional winds over the Arabian Peninsula mainly affect the moisture transportation in winter.

关键词: 帕米尔高原、降水、WRF、水汽来源