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城市化对青岛夏季海陆风环流影响的个例分析

Impacts of urbanization on summer-time sea-land breeze circulation in Qingdao

关键词: [城市下垫面](#) [海陆风](#) [城市热岛](#) [青岛](#)

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摘要: 基于分辨率为500 m的青岛地区下垫面土地利用资料,利用中尺度大气数值模式Weather Research & Forecast(WRF),模拟分析了不同城市下垫面情形下,2007年8月4-5日青岛地区的一次海陆风过程.控制试验和干农田下垫面及城市下垫面两个敏感性试验都模拟出了海陆风的转换过程及城市小风区和城市热岛现象.模拟分析结果表明,城市化进程下城市区域气温明显升高,增温幅度为1~2℃,高密度城市下垫面造成的城市热岛效应增大了海陆温差,加强了海风,青岛城市热岛环流受海陆风影响显著;干农田地貌与灌溉农田、林地下垫面相比,不利于局地降温,但与城市下垫面相比,有效地加强了近地面风速.

Abstract: A sea-land breeze circulation case in Qingdao during 4~5 August 2007 is studied by using the Weather Research & Forecasting (WRF) model under different land use conditions. Three experiments, Control, City and Land are designed to simulate the sea-land breeze circulation for current land use, urbanization (with increased city area), and dry cropland conditions, respectively. The control experiment was based on the observed 500 m resolution land use data for Qingdao. All three experiments simulated the processes of sea and land circulation and the urban heat island which are characterized by a weaker wind area around city. However, in the urbanization case, the temperature over the land increased by 1~2 degrees centigrade and the difference between the land and the sea also increased, leading to strengthened sea breeze. The sea breeze has a great influence on the heat island circulation in Qingdao. The dry cropland case did not show much change in air temperature over land as compared to irrigated land, but the dry cropland resulted in a stronger wind than that in the case of urban land.

Key words: [urban land-use](#) [sea-land breeze](#) [heat island](#) [Qingdao](#)

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