西沟孔兑下垫面特征及风沙输移规律研究

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摘 要：黄河上游十大孔兑对黄河生态和周边地区发展存在严重威胁。通过样方调查划分下垫面类型和利用集沙仪和 HOBO 小型数采仪配套三杯风速仪及风向标对各个下垫面的输沙量和风速、风向进行观测，对十大孔兑之一西柳沟风沙区展开研究，探究该地区不同下垫面特征及风沙输移规律，为相似流域保护与治理提供参考依据。结果表明：（1）西柳沟孔兑风沙区下垫面划分为流动沙地、半固定沙地和固定沙地，流动沙地河床面积、长度和宽度均高于固定和半固定沙地。（2）研究区盛行风均为西南风，主害风为西北风；且近地面风速变化随距离地表高度的增加呈现递增趋势。（3）处在相同的下垫面类型中，随着距离地表高度增加，输沙率呈现减少的趋势。处在不同下垫面时，由于地表粗糙度不同，处在相同地表高度的输沙率也不相同，也呈现减少的趋势，表明地表粗糙度对于沙粒的运动有着一定的阻碍作用。

关键词：西柳沟；下垫面；风沙运动；输沙量

Study on The Characteristics of the Underlying Surface of Xiliugou Hole and The Law of Aeolian Sand Transport

Abstract： The ten major Kongdui in the upper reaches of the Yellow River pose a serious threat to the ecology of the Yellow River and the development of the surrounding areas. Through the sample survey, the type of the underlying surface was divided and the sand collecting instrument and HOBO small data collection instrument were used to observe the sand transport volume, wind speed and wind direction of each underlying surface, and the wind and sand area of Xiliugou, one of the ten major Kongdui, were studied, and the characteristics of different underlying surfaces and the law of aeolian sand transport in the area were explored, which provided a reference basis for the protection and treatment of similar river basins. The results showed that: (1) The underlying surface of the Xiliugou hole to aeolian sand area was divided into flowing sand, semi-fixed sand and fixed sand, and the area, length and width of the riverbed of the flowing sand were higher than that of fixed and semi-fixed sand. (2) The prevailing winds in the study area were all southwest winds, and the main harmful winds were northwest winds; Moreover, the change of wind speed near the ground showed an increasing trend with the increase of the height from the surface. (3) In the same underlying surface type, with the increase of the height from the surface, the sand transport rate showed a decreasing trend. When there are different underlying surfaces, due to the different surface roughness, the sand transport rate at the same surface height is also different, and it also shows a trend of reduction, indicating that the surface roughness has a certain hindering effect on the movement of sand grains.

Key Words: Xiliugou；Lower cushion surface；Wind and sand movement；The amount of sand transported