A Big Earth Data Platform for Three Poles

**Vulnerability forecast scenarios dataset of water resources, agriculture, ecosystem of Aksu River Basin (Version 1.0) (2010-2050)**

1、Description

By applying supply-demand balance analysis, the water resource supply and demand of the whole river basin and each county or district were calculated, and the results were used to assess the vulnerability of the water resources system in the basin.
The IPAT equation was used to establish a future water resource demand scenario, which involved setting various variables, such as the future population growth rate, economic growth rate, and water consumption per unit GDP. By taking 2005 as the base year and using assorted forecasting data of population size and economic scale, the future water demand scenarios of various counties and cities from 2010 to 2050 were predicted.
By applying the basic structure of the HBV conceptual hydrological model of the Swedish Hydro-meteorological Institute, a model of the variation trends of the basin under a changing climate was designed. The glacial melting scenario was used as the model input to construct the runoff scenario in response to climate change. According to the national regulations of the water resource allocation in the basin, a water distribution plan was set up to calculate the water supply comprehensively. Considering the supply and demand situation, the water resource system vulnerability was evaluated by the water shortage rate. By calculating the grain production-related land pressure index of the major counties and cities in the basin, the balance of supply and demand of land resources in scenarios of climate change, glacial melting and population growth was analysed, and the vulnerability of the agricultural system was evaluated. The Miami formula and HANPP model were used to calculate the human appropriation of net primary biomass and primary biomass in the major counties and cities in the future, and the vulnerability of ecosystems from the perspective of supply and demand balance was assessed.

2、Keywords

Theme：Population,Desert,Social and Economic,Water Resources,Population number
Discipline：Terrestrial Surface,Human-nature Relationship
Places：Aksu River Basin
Time：2010-2050, 2005

3、Data details

1.Scale：None

2.Projection：

3.Filesize：0.27MB

4.Data format：EXCEL

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：41.0 | - |
| west：80.0 | - | east：81.0 |
| - | south：40.0 | - |

5、Time frame:2005-01-09 08:00:00+00:00--2051-01-08 12:32:00+00:00

6、Reference method

References to data:

YANG Linsheng. Vulnerability forecast scenarios dataset of water resources, agriculture, ecosystem of Aksu River Basin (Version 1.0) (2010-2050). A Big Earth Data Platform for Three Poles, doi:10.11888/Socio-econ.tpe.0000003.file2018

References to articles:

张九天, 何霄嘉, 上官冬辉, 钟方雷, 刘时银. (2012). 冰川加剧消融对我国西北干旱区的影响及其适应对策[J]. 冰川冻土, 34(4), 848-854.

国家发改委应对气候变化司, 21世纪议程管理中心. (2012). 气候变化对中国的影响评估及其适应对策——海平面上升和冰川融化流域[M]. 北京: 科学出版社,

7、Supporting project information

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）

8、Data resource provider

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