A Big Earth Data Platform for Three Poles

**Vulnerability forecast scenarios dataset of the water resources, agriculture, and ecosystem of the Heihe 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, based on which the vulnerability of the water resources system of the basin was evaluated. The IPAT equation was used to set a future water resource demand scenario, setting variables such as future population growth rate, economic growth rate, and unit GDP water consumption to establish the scenario. 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 forecast. By applying the basic structure of the HBV conceptual hydrological model of the Swedish Hydrometeorological Institute, a model of the variation tendency of the basin under climate change was designed. The glacial melting scenario was used as the model input to construct the runoff scenario under climate change. According to the national regulations of the water resources allocation of the basin, a water distribution plan was set up to calculate the water supply comprehensively. Considering of the supply and demand situation, the water resource system vulnerability was evaluated by the water shortage rate. By calculating the (grain production) land pressure index of the major counties and cities in the basin, the balance of supply and demand of land resources under the climate change, glacial melt and population growth scenarios was analyzed, 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 for 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：Heihe River Basin
Time：2010-2050, 2005

3、Data details

1.Scale：None

2.Projection：

3.Filesize：0.25MB

4.Data format：EXCEL

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：42.42 | - |
| west：96.0 | - | east：102.0 |
| - | south：37.41 | - |

5、Time frame:2005-08-13 21:46:00+00:00--2051-07-13 21:46:00+00:00

6、Reference method

References to data:

YANG Linsheng. Vulnerability forecast scenarios dataset of the water resources, agriculture, and ecosystem of the Heihe River Basin (Version 1.0) (2010-2050). A Big Earth Data Platform for Three Poles, doi:10.11888/Socio-econ.tpe.0000005.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.

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7、Supporting project information

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

8、Data resource provider

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