A Big Earth Data Platform for Three Poles

**A dataset of human footprint over the Qinghai-Tibet Plateau during 1990–2017**

1、Description

Since the first Industrial Revolution, human activity has profoundly affected all spheres of the earth, and this influence will continue to expand and intensify. As an ecosystem unit with global significance, the Qinghai-Tibet Plateau (QTP) is also an important ecological security barrier in China, playing a crucial role in soil and water conservation, biodiversity conservation, water conservation and carbon balance. However, in the past 30 years, with the expansion of the scope and rapid growth of the intensity of human activities on the QTP, a series of ecological and environmental issues caused by human activities have become increasingly prominent and seriously affected the ecological functions of the QTP. The comprehensive spatial dataset that records human activity intensity will contribute to a deeper understanding of the intensity and scope of human activities in the region, reveal the law of change of human activities in the context of climate warming, and have important significance for further quantitative identification of the impact of human activities and climate change on the ecosystem, as well as promoting the sustainable development of the region.
In this study, the human footprint index method was adopted to evaluate the intensity of human activity on the QTP, which used six types of spatial data as indicators of human activities, including population density, land use, grazing density, night lighting, railway and road. The dataset records indicators of human activity intensity in the seven phases, namely, 1990, 1995, 2000, 2005, 2010, 2015 and 2017. The optimization and adjustment of the human footprint method in this dataset mainly include: (1) Six kinds of data including population density, land use, night lighting, grazing density, road and railway were selected to calculate the intensity of human activities; (2) Adjust the assignment of different land use types; (3) The maximum intensity threshold of population density was set at 50 people/km2, and the logarithmic method was used to assign the value. (4) The cattle and sheep density data were used to characterize the grazing density, and the maximum intensity threshold was set as 1000 sheep units/km2, and the logarithmic method was used to assign the value. (5) The corrected DMSP/OLS night lighting data were used for assigning values; (6) Divide the road into five grades, namely expressway, national road, provincial road, county road and other roads, and assign values respectively; (7) The maximum influence range of railway is set as 3.5km; (8) Using glacier and lake spatial data for quality control .
The dataset contains the data from "Duan, Q., & Luo, L. (2020). A dataset of human footprint over the Qinghai-Tibet Plateau during 1990–2015. China Scientific Data, 5(3). https://doi.org/10.11922/csdata.2019.0082.zh", and the newly produced data of 2017.
This dataset can provide spatial data for exploring the characteristics and rules of spatial changes of human activities in the Qinghai-Tibet Plateau, and can also provide support for exploring the interaction between human activities and ecological environment in the region. it can play a guiding role in promoting the ecological environment protection and sustainable development of the entire Qinghai-Tibet Plateau.

2、Keywords

Theme：Human-nature Remote Sensing,human footprint,human activity intensity
Discipline：Human-nature Relationship
Places：Tibetan Plateau
Time：2000, 2005, 2017, 2010, 1995, 1990, 2015

3、Data details

1.Scale：1000

2.Projection：Albers

3.Filesize：164.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：43.53 | - |
| west：73.28 | - | east：104.48 |
| - | south：23.05 | - |

5、Time frame:1989-12-31 16:00:00+00:00--2017-12-31 03:59:59+00:00

6、Reference method

References to data:

LUO Lihui, DUAN Quntao. A dataset of human footprint over the Qinghai-Tibet Plateau during 1990–2017. A Big Earth Data Platform for Three Poles, doi:10.11922/sciencedb.9332021

References to articles:

段群滔, 罗立辉. (2020). 1990–2015年青藏高原人类足迹数据集. 中国科学数据, 5(3). https://doi.org/10.11922/csdata.2019.0082.zh

Luo, L., Ma, W., Zhuang, Y., Zhang, Y., Yi, S., Xu, J., Long, Y., Ma, D., & Zhang, Z. (2018). The impacts of climate change and human activities on alpine vegetation and permafrost in the Qinghai-Tibet Engineering Corridor. Ecological Indicators, 93, 24-35. DOI:10.1016/j.ecolind.2018.04.067

Luo, L., Duan, Q., Wang, L., Zhao, W., & Zhuang, Y. (2020). Increased human pressures on the alpine ecosystem along the Qinghai-Tibet Railway. Regional Environmental Change, 20(1). DOI:10.1007/s10113-020-01616-7

7、Supporting project information

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