

Brief Introduction to Haibei Alpine Meadow Ecosystem Research

Station

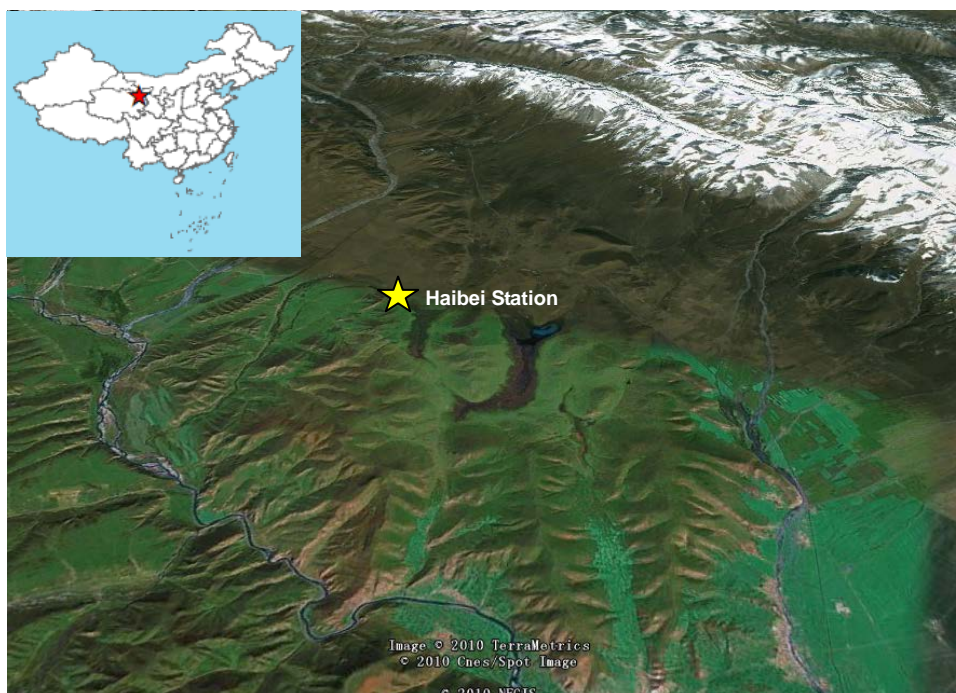
History

The Haibei Alpine Meadow Ecosystem Research Station (Haibei Station) was founded in 1976 by the Northwest Institute of Plateau Biology (NWIPB) of the Chinese Academy of Sciences (CAS). Haibei Station has become one of the Open and Key stations of the Chinese Ecosystem Research Network (CERN) in 1989 and 1992, respectively. Since 2001 it is one of the field observation and testing stations of the Ministry of Science and Technology of the P.R. of China.



Geography

Haibei Station is located in the northeast of the Tibetan plateau ($37^{\circ}29'$ – $45'$ N, $101^{\circ}12'$ – $23'$ E), in a large valley oriented northwest–southeast and surrounded on all sides by the Qilian Mountains. The altitude of the Station is 3250 m a.s.l., the valley area around the Station ranges from 2900–3500 m and the surrounding mountains reach 4000 m a.s.l. The Datong River passes to the south of the area. The larger region is characterized by tall mountain ranges with steep valleys and gorges interspersed with relatively level and wide inter-mountain grassland basins.





Climate

The climate at the Haibei Station is controlled by the southeast monsoon and high pressure from Siberia. It has a continental monsoon type climate, with severe and long winters and short cool summers. The annual average temperature is -1.7°C with maximum 27.6°C and minimum -37.1°C . During winter months, the average temperature can drop to -15°C or even -20°C in highland areas. During summer, the temperature in the warmest month (July) reaches about $14\text{--}22^{\circ}\text{C}$ in the valleys and $4\text{--}10^{\circ}\text{C}$ on the mountains. The average annual precipitation ranges from 426 to 860 mm of which 80% fall in the short summer growing season from May to October. The annual average sunlight is 2642.7 hrs with 60.1% total available sunshine.

Soil

The soil types are dominated by Mat Cryic Cambiols (Alpine meadow soil), Mollic Cryic Cambisols (Alpine shrub soil), and Orthic Spodosols (Bog soil). They are undeveloped gravel soils of about 60–70cm and characterized by high organic matter content (about 12–27%) and total nitrogen, phosphorus and potassium but lacking available nutrients. The parent material is loess; native rock is diluvium and alluvial deposit.

Vegetation

The vegetation around the station belongs to typical zonal vegetation of the Tibetan Plateau, with three main types. On the sunny slopes of mountains and on the plains, the vegetation is mainly alpine meadow dominated by *Kobresia humilis*, *Festuca*

ovina and *Elymus nutans*. The shade slopes of the mountains are covered with alpine shrub meadow, dominated by *Potentilla fruticosa* and *K. humilis*, *F. ovina* and *E. nutans*. Marsh vegetation consists primarily of *K. tibetica* and *Pedicularis longiflora*.

Animals

The most important herbivorous animals in the region are domestic Tibetan sheep and yaks. The Tibetan sheep is one of oldest sheep breeds in China. In the research region, most sheep are this Tibetan breed, although there are some crossbreeds originating from crosses with sheep from other provinces in China. Yaks are well adapted to the conditions of the Tibetan Plateau at an altitude of 3000–6000 m with very low temperatures. The dominant rodents are plateau pika (*Ochotona curzoniae*) and zokor (*Myospalax baileyi*) in the grassland. *Mustela altaica* and *M. eversmanni* are common small carnivores, the large carnivores such as *Vulpes ferrilatus* and *Canis lupus* are rare.

Soil microorganisms

In the 0–10 cm top layer of the meadow soil, there are approximately $25\text{--}85\times 10^6$ bacteria g^{-1} , $9\text{--}20\times 10^4$ actinomycetes g^{-1} and $1\text{--}8\times 10^4$ fungi g^{-1} . These values decrease gradually with increasing depth. The numbers of bacteria and actinomycetes are highest from mid-July to early September. The number of fungal spores, however, is lower in the warm than in the cold season.

For species catalog of Haibei station, please see appendix 2