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**CONTROL ID:** 1496738**TITLE:** Changes of Grassland Types and Net Primary Production of North America, Europe, Australia, and China in Response to Global Climate Change from 1911 to 2000**ABSTRACT BODY:** The purpose of this study was to explore the changes of area of each broad potential vegetation category from 1911 to 2000 based on the CSCS method and their Net Primary Production (NPP) to analyze the influence of global climate change at global scale. we studied the characteristics of global Potential Natural Vegetation (PNV) distribution in the 20th century using the CSCS approach to explore the distribution of more detailed grassland vegetation types and their NPP using the Thornthwaite Memorial model.

Results showed that: (1) the area of tundra and alpine steppe and desert decreased by 5.09% and 5.82% respectively, while the area of forest and grassland increased by 2.31% and 3.62% from 1911 to 2000 at global scale, respectively. However, there was a significant difference in the magnitude of area change in northern and southern hemispheres. (2) In Australia, the area of warm desert grassland decreased by  $140.75 \times 10^4 \text{km}^2$ , while the area of savanna increased by  $145.75 \times 10^4 \text{km}^2$ , and the semi-desert grassland and steppe decreased by  $4.25 \times 10^4 \text{km}^2$  and  $2.75 \times 10^4 \text{km}^2$ , and the area of forest increased by  $1.75 \times 10^4 \text{km}^2$ . (3) In Europe, the area of semi-desert increased by  $48.93 \times 10^4 \text{km}^2$ , nearly 46.2% of semi-desert increased in Spain, while the area of forest decreased by  $201.35 \times 10^4 \text{km}^2$ , and the biggest decreased was recorded in Ukraine (80.83%). (4) In North America, the area of warm desert and forest increased by 9.26% and 4.58%, while the cold desert decreased by 55.56%; in Canada, the area of steppe decreased by 38.46%, while the area of forest increased by 7.49%; in Mexico, the area of warm desert and forest increased by 39.74%, while the area of the steppe decreased by 18.75%. (5) In China, the area of temperate humid grassland increased by 28.6% in Xinjiang, and 66.67% in Tibet, the area of forest in Xinjiang and Qinghai increased 33.3% and 15.4% respectively, while the area of tundra and alpine decreased by 7.02% in Xinjiang, while it increased 9.38% in Sichuan.

The global potential NPP increased by 1.91% during 1911 to 2000: (1) In Australia, the NPP of warm desert in the last decade was 424.32 Tg C, decreased by 51.04% during the 90 years, while the temperate humid grassland increased to 5.05 Tg C. (2) In Europe, the NPP of steppe and forest decreased by 6.2% and 2.68% respectively, while the NPP of semi-desert, savanna, temperate humid grassland and tundra & alpine increased by 25.96%, 19.54%, 16.64%, and 2.35%. (3) In North America, the NPP of desert decreased by 13.6%, while the NPP of tundra and alpine increased by 5.96%. (4) In China, the NPP of desert decreased by 0.61%, while the NPP of forest increased to 5483.18 Tg C from 1911 to 2000. In conclusion, at global scale, the CSCS model classifies the PNV into 42 classes that can be merged into 10 broad vegetation categories. Over the study period of 90 years, the area of tundra, alpine steppe, and desert shows a decrease (by 5.09% and 5.50%), while the area of forest and grassland shows increase (by 2.31% and 3.76%).

**CURRENT SECTION/FOCUS GROUP:** Global Environmental Change**CURRENT SESSION:** GC019. Environmental, Socio-economic and Climatic Change in Northern Eurasia and Their Feedbacks to the Global Earth System**INDEX TERMS:** [0428] BIOGEOSCIENCES / Carbon cycling, [1637] GLOBAL CHANGE / Regional climate change, [1632] GLOBAL CHANGE / Land cover change.

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