



## **GLOBE seasons and biomes: an international IPY Earth science project**

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The international network of schools in the Global Learning and Observations to Benefit the Environment (GLOBE) Program are involved in the GLOBE Seasons and Biomes Project, one of the International Polar Year (IPY) education outreach projects under the University of the Arctic IPY Program Providing Higher Education and Outreach cluster. Seasons and Biomes is inquiry – and project-based, and integrates research and education for primary and secondary teachers and their students. GLOBE ([www.globe.gov](http://www.globe.gov)) is a worldwide Earth system science education program that has brought together scientists, educators, pre-college teachers and students in schools more than 100 countries, conducting Earth science investigations in atmosphere/weather, surface water hydrology, soils, land cover and phenology. The standardized measurement protocols and learning activities have been translated into six United Nations languages. Students make measurements at or close to their schools and report the data to the GLOBE data server, making the data available to students, scientists and others who may be interested in using the data for their own investigations.

Seasons and Biomes organizes GLOBE schools into global learning communities according to their biomes. Taiga, Tundra, Deciduous Forest, Desert, Grasslands, Rain Forest, Savannah, Shrubland, Urban and Agricultural Land. The project will utilize GLOBE protocols on temperature, soils, and land cover, adapt the vegetation phenology protocols for use in specific biomes and also develop ice phenology and frost tube protocols for Arctic and other northern latitude regions, and the mosquito phe-

nology protocols for Tropical regions. Professional development workshops will be conducted and offered as a University of Alaska course to pre-college teachers. The teachers in turn teach their students and work with them to monitor the seasons in their biomes by conducting relevant Earth system science studies locally that also connect globally. Seasons and Biomes connects the teachers and students to scientists in three Earth system science programs: The International Arctic Research Center (IARC), and the NASA Terra and Landsat Data Continuity Missions and to scientists in other countries as well. This project will contribute to student understanding of the Earth as a system, why IPY is important and how Polar regions affect their own regions and vice versa, as well as to an appreciation of different cultures. Seasons and Biomes is also expected to contribute much needed Earth/environmental science data that will be useful for climate impact assessments, prevention and management of diseases and validation of satellite data.