

The Culturally Responsive Biological Science Education Project

As part of Alaska EPSCoR's continuing commitment to involve younger students and rural schools in its activities, a new secondary school education program is being launched in 2008. The Culturally Responsive Biological Science Education Project will enable rural Alaskan students to contribute valuable information to EPSCoR's database while learning about scientific research methods and local biology.

The project will consist of new professional development courses and curricula geared toward secondary school science teachers in rural Alaska. Designed to incorporate up-to-date science with Native ways of knowing, the curricula will lay out field work and data-collection experiments for students to undertake in three distinct knowledge areas:

1. The *Pathogens and invasive plant species* study module will focus on plant pathogens, making students aware of the threats posed by invasive plant species while teaching field and lab techniques;
2. The *Nitrogen fixers and mycorrhizae* study module will focus on mycorrhizae (symbiotic fungi which provide plants with nutrients and water) and N-fixers (symbiotic bacteria which provide plants with nitrogen.) The module will include instruction in basic techniques to



A stand of balsam poplar, a species which will be closely examined by Project students.

survey mycorrhizae and/or N-fixers on lowbush cranberry, blueberry and alder species, and to link their findings with climate data; and

3. The *Biogeography* module will focus on the differences in plants in different parts of Alaska, by having students collect samples of balsam poplar (*Populus balsamifera*) and study the environmental cues needed for the plant to break a state of dormancy.

The project will be overseen by a team of experts from UAF and UAS, with the modules designed jointly by a scientist and an experienced high school teacher. In addition to their primary biological components, they will also encompass aspects of the physical and social science research integral to Phase III of EPSCoR.

The program represents a "win-win" situation for students, teachers and researchers. The data collected by students will be included in EPSCoR's central database, thus providing rural students the opportunity to participate in a state-wide research project. Rural teachers will receive course credit while learning about field techniques and sharing their teaching expertise with the UA team. Finally, the program will enable scientists to acquire data from disparate locales that would otherwise be impossible to survey.



A massive stand of Japanese knotweed, an invasive species in Alaska. Invasive plant species are one of three study areas in the Culturally Responsive Biological Science Education Project.