Teacher's Guide

Scientists around the world have made detailed observations of the impacts that climate change has already made on ecosystems. It is difficult to make future projections based on these observations because of the complexities involved in human/nature interactions (e.g., land use change). Nevertheless, the observed changes are compelling examples of how rising temperatures can affect the natural world and raise questions of how vulnerable species will adapt to direct and indirect effects associated with climate change. The knowledge we gain from these observations also gives us insight as to how we as humans may be able to help species adapt. Thus, this kit has been developed through the cooperation of staff from eight federal agencies: U.S. Environmental Protection Agency, National Park Service, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, Forest Service of the U.S. Department of Agriculture, Bureau of Land Management, and the U.S. Geological Survey.

Purpose

The purpose of the *Climate Change, Wildlife and Wildlands Toolkit for Formal and Informal Educators* is to provide classroom teachers and informal educators (e.g., park and refuge interpreters, zoo and aquarium educators, science museum docents, etc.) with the tools to educate middle school students about the science of climate change, its impacts on U.S. wildlife and wildlands, and what kids can do to help address the issue.

Contents

The contents of the *new* 2009 version of the *Climate Change, Wildlife and Wildlands Toolkit for Formal and Informal Educators* will be posted online on the EPA climate change website as the various pieces of it are finalized. The contents currently available online include:

- **Back to Basics**, the science of global warming/climate change in a "Frequently Asked Questions" format.
- **Case studies** of eleven distinct eco-regions in the U.S. Topics in the case studies include regional impacts of climate change, "Spotlight on Species" on public lands that are being affected by climate change, and strategies being employed by "Climate Stewards" in each region who are helping ecosystems adapt to a changing world. The 11 eco-regions are:
    - Western Forests and Mountains
    - Western Coastline
    - Eastern Coastline
    - Gulf Coast
    - Pacific Islands
    - Caribbean
    - Great Lakes
    - Eastern Forests and Woodlands
    - Polar / Subpolar (Alaska)
    - Desert Arid
    - Prairie Grasslands

- **Activities for students** – based on the 11 eco-region case studies – including science, social science, math, language arts, and art activities. Developed by master teachers in the 2008 Albert Einstein Fellowship Program, the activities are fun, educational, and easily adapted to a variety of settings and ability levels. The specific Climate Literacy Guidelines and National Education Standards are referenced for each activity.
- **Glossary** of Scientific Terms – great for vocabulary development.
- Template and instructions for making the popular EPA **Global Warming Wheel Card**
- PDF of **Poster titled "How Do You Measure Up**?" illustrating the importance of setting goals to reduce greenhouse gas emissions in households, schools, communities, etc., by first taking an inventory of one's present emissions.

Availability

The entire toolkit, including all of the content listed above plus the following, will be available on DVD FREE for educators in late 2009, through the National Service Center for Environmental Publications, 1-800-490-9198, http://www.epa.gov/nscep/ ,as well as from the partner agencies.

- **Map of U.S.** with overlays of public lands areas and the 11 U.S. eco-regions identified in the kit.
- **Video** – 10 minute, high definition, engaging and highly informative video on climate change science and impacts on wildlife and their habitat in U.S., to be used in classrooms as an introduction to the topic or in Visitor Centers and in docent/interpreter talks in informal educational settings.
- **Fact sheets** on how migratory birds and cold-water fish will be impacted by climate change.