Climate Literacy and Energy Awareness Network (CLEAN) Pathway

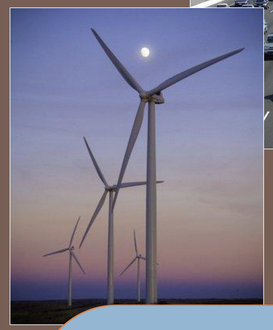
Teaching Climate and Energy Science: Teaching materials, Professional Development, Social Networking

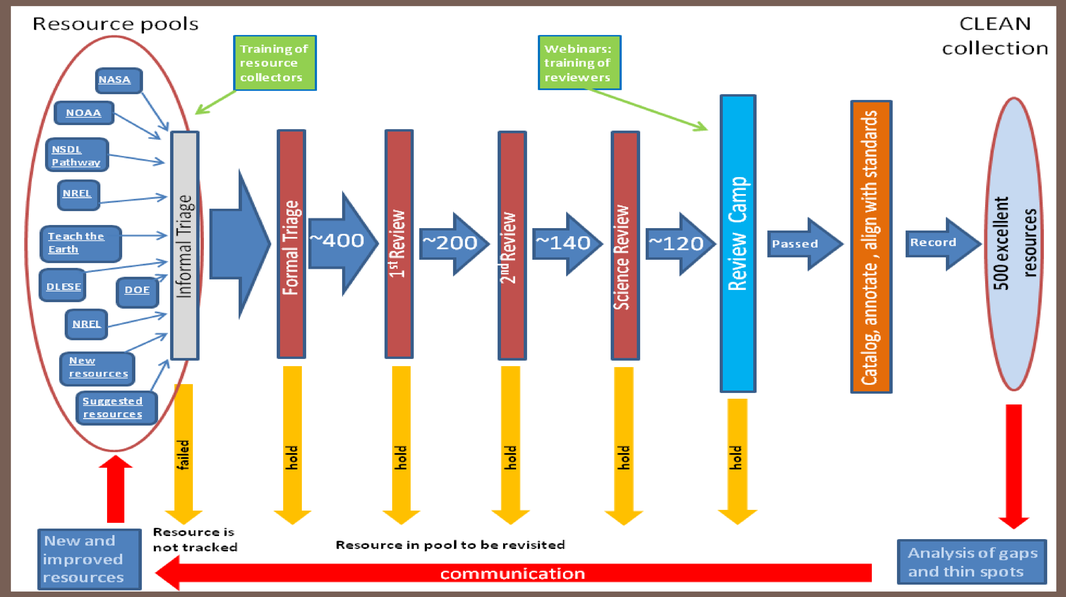
Tamara S. Ledley, Marian Grogan, Jeffrey Lockwood, Chris Comer, TERC; Mark S. McCaffrey, Susan M. Buhr, Anne U. Gold, Susan Lynds, CIRES, University of Colorado Boulder; Cathryn A. Manduca, Sean Fox, Karin Kirk, Ellen Iverson, SERC, Carleton College; Frank Niepold, NOAA; Cynthia Howell, NREL; Scott Carley, College of Exploration

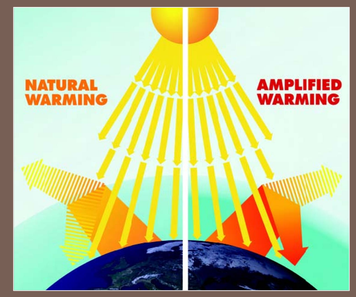



Introduction

To provide students with accurate information about climate and energy science, educators require scientifically and pedagogically robust teaching materials. This is especially important for topics in which scientific understanding is rapidly evolving and because educators have often not had formal training in climate science. To address this need, the Climate Literacy & Energy Awareness Network (CLEAN) Pathway has launched the first part of a new **peer-reviewed and annotated digital collection** featuring high-quality teaching materials centered on climate and energy science for grades 6 through 16. **Professional development opportunities** and a **social networking platform** for educators will be offered in the fall of 2011.

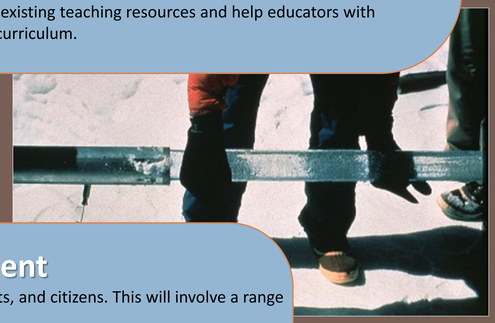


Review Process:

We have designed a rigorous and transparent peer-review process for the CLEAN collection. While a peer-review process is desirable for curriculum developer as well as collection builder to ensure quality, its implementation is non-trivial. Our experiences provide general guidelines that can be used to judge the quality of digital teaching materials across disciplines.

Our multi-stage review process (see figure to the left) ensures that only resources with teaching goals relevant to developing climate literacy and energy awareness are considered. Each relevant resource is reviewed twice against an extensive set of review criteria to assess the i**) scientific accuracy**, ii) **pedagogic effectiveness**, and iii) **usability/technical quality**. An additional science review by a topic expert ensures the scientific quality and accuracy. Resources that pass all review steps are forwarded to a review panel of educators and scientists who make a final decision regarding inclusion of the materials in the CLEAN collection.

About 500 resources entered the formal review process in this first round. About 20% (~100) of those passed final review. Reviewer comments are recorded as teaching tips to enhance existing teaching resources and help educators with implementation in their curriculum.

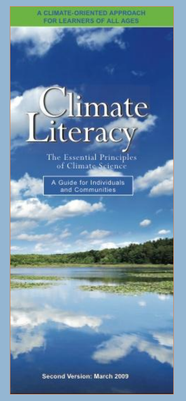


CLEAN Project Goals:

The CLEAN project provides excellent teaching materials to educators, students, and citizens and aims to increase their climate literacy and ability to make informed decisions concerning energy use and planetary stewardship.

The CLEAN project has two major components:

1) The **CLEAN Collection** of excellent digital teaching materials that is accessible through an easily searchable web interface. Collection is officially launched – Nov 1, 2010 - at *http://cleanet.org.*
   - All teaching materials are pedagogically and scientifically peer-reviewed and annotated.
   - Scope of collection is defined by Essential Principles of Climate Literacy and Energy Awareness Principles.
   - Teaching materials are aligned with Benchmarks for Science Literacy and National Science Education Standards, and will be aligned with the NAAEE Excellence in Environmental Education Guidelines for Learning through interactive NSDL strandmaps.
2) The **CLEAN Community** of users will be supported in the effective use of the resources through Professional Development opportunities and Online Communities.



cleanet.org

Professional and Community Development

The project facilitates the effective use of the resources with teachers, students, and citizens. This will involve a range of activities including:

1) **Teleconference–Online Workshops** to help educators and citizens use teaching materials from the collection and integrate them into the classroom. These two–hour workshops will introduce teachers and citizens to software tools, data, inquiry activities, and information and will be modeled after the successful Earth Exploration Toolbook (EET) Workshops (*http://serc.carleton.edu/eet/workshops.html*).
2) **Multi-day Workshops** for faculty on teaching specific aspects of climate and energy will be modeled after the On the Cutting Edge virtual workshops on Hurricanes and Climate Change (*http://serc.carleton.edu/NAGTWorkshops/hurricanes08/index.html*).
3) Building and organizing an **Online Community** using Web 2.0 social networking tools to facilitate collaboration, interactivity, and knowledge sharing among users. The tools that will likely be deployed include wikis, podcasts, blogs, RSS feeds,and "Ning" Software.
4) Facilitate and expand the existing **Climate Literacy Network** (*http://cleanet.org/cln*) to include existing and emerging climate and energy education activities, experts, and enthusiasts.