Development and Gap Analysis of Climate Change Educational Resources Collection for K-12

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Overview

Creating premier digital collections for specific scientific topics is a challenge. The issue is important because teachers are increasingly supplementing traditional classroom materials such as textbooks with information, lesson plans and activities from the World Wide Web. Unlike texts and other edited materials, resources found on the web may not go through rigorous editing procedures. Moreover, the sheer number of available sites makes it time consuming and often frustrating for teachers to find scientifically accurate materials that are usable in a classroom.

The DLESE Climate Change project , funded through NSF grant EAR-0435645, brought together three middle school teachers, an atmospheric scientist and a cognitive scientist to create a tool for evaluating and selecting digital resources. The team members then applied this tool (called a rubric and nicknamed “scorecard” by review team) to select materials.

The DLESE Climate Change project found that evaluating resources with this tool involved a time commitment incommensurate with the goals of the project. A simplified rubric allowed reviewers to cover more material and resulted in a collection that embodied high quality and usable resources.

Issues raised by this selection model include the transferability of the rubric to other reviewers and the role of differential expertise in the review process. Simplifying the rubric involves a trade-off. An easier to use rubric allows community members with limited time to review a greater number of resources. However, simplified rubrics provide only limited information about the exact basis of quality judgments to others wishing to participate in the review process independently. The basis for making judgments about what is, and is not a good resource, while shared among the team members through discussions during meetings, may not be evident to those outside of the team.

Differential expertise and experience was also an issue because of the importance of assuring that resources are scientifically accurate and usable in the classroom. While many resources fit both of these important criteria, the climate scientist on the project performed double duty reviewing each resource for accuracy.

http://serc.carleton.edu/climatechange/

Steps in Developing the Climate Change Collection

1) **Recruit the interdisciplinary review team** (Climate scientist, teachers, learning researcher, evaluator)
2) **Review prior collection efforts, including scope statements and rubrics**
3) **Develop scope statement and rubric (scorecard); test and fine tune scorecard**
4) **Develop framework of key concepts relating to climate change and variability**
5) **Identify and review high quality resources relating to climate change**
6) **Review reviews with team and agree on what to include in collection**
7) **Compile reviews in summary and link to Climate Change Collection homepage** ***(in progress)***
8) **Publicize and Market Climate Change Collection**

Key Lessons Learned

1) Fully analytic rubrics (e.g. CRS) may be burdensome for reviews to use because they are time-consuming and difficult to fill out. More holistic rubrics than the CCC scorecard can be used but the results may produce a less transferable and reliable assessment system.

2) Getting teachers and scientists together to search and rate resources is a good model because they are a captive (and compensated) audience.

3) Scientific accuracy is the most important criterion for judging resources.In the future, at least two scientists should be involved in the review teams.

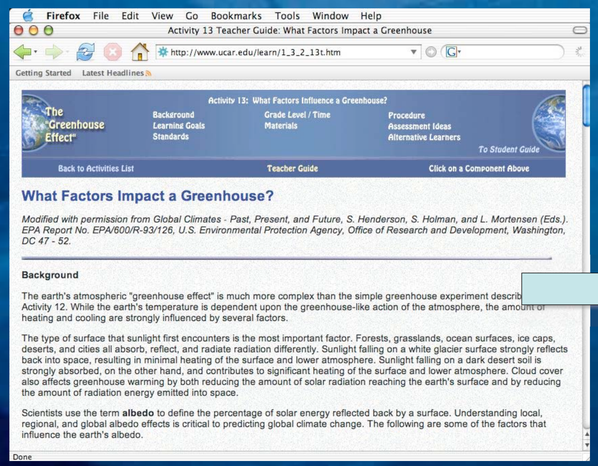
4) The searching and rating functions should be separated

5) High standards should be set from the outset.

Filling The Climate Knowledge Gap

1) Initiate a comprehensive review of all new products not represented in the Climate Change Collection using the revised collection process.
2) Align the Climate Change Collection with National Standards and Project 2061 Benchmarks for Science Literacy
   - **Misconceptions & General Information**
   - **Timescales of Weather and Climate, Climate Variability, Greenhouse Effect, Energy Balance, & Abrupt Climate Change**
   - **Carbon & Carbon Calculator**
   - **Regional Impacts, Social Impacts, Health & Policy**
3) Expand the Climate Change Collection process to the Climate Literacy efforts currently underway by NOAA’s Climate Program Office and National Standards and Project 2061 Benchmarks for Science Literacy’s Weather and Climate Next Generation of Curriculum and Assessment Material.

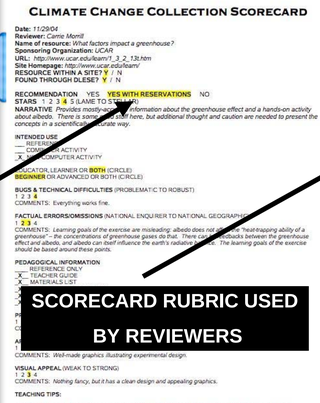
IDENTIFY RESOUCE



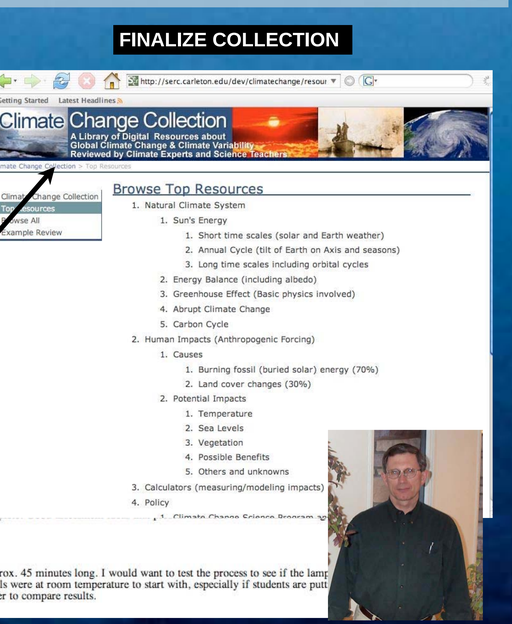
SWIKI USED TO COORDINATE REVIEWS

Carrie Morrill is a climate research scientist at NCAR

SCORECARD RUBRIC USED BY REVIEWERS



SUMMARY REVIEW COMPILED



FINALIZE COLLECTION

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