Andy’s Message

We have had a busy and productive month since our last issue of the Carbon TIMEs. We have had workshops with the KBS teachers in Michigan, the Roosevelt teachers in Seattle, and the Bellevue teachers. Jenny is taking the lead in planning for a distant workshop with teachers in Maryland, Colorado, and California. We are also continuing to get materials up on the website and revise the materials that are there. We have pretty complete materials for four units (Systems and Scale, Animals, Plants, and Decomposers). We are also updating materials as we make improvements or find mistakes—check for the red notes about revisions. Watch for Ecosystems in December! Finally, we are happy about how many of you are participating in the project Wiki, by sharing resources, stories, and photos, or by giving us comments on the units. We will be starting to work more on analyzing data soon, so be expecting to hear from us about that. Our best wishes to everyone as we look forward to the holiday season!

-Andy

Upcoming Events & Important Dates

Workshop
Dec 7
Distance workshop for teachers not in the Lansing area.

Ecosystems Unit
December
Coming soon!
TRIVIA QUESTION: Which of these activities contributes the most to carbon emissions globally: agriculture, transport, forestry, or energy production?
Dear Staci

Website

**Dear Staci: What is the Carbon TIME webpage URL for the curriculum materials and assessments?**

**Staci:** I know that one, I visit every day! [http://edr1.educ.msu.edu/environmentallit/publicsite/html/cc_tm_1112.html](http://edr1.educ.msu.edu/environmentallit/publicsite/html/cc_tm_1112.html) Make sure to bookmark it. The link is also available on the wiki.

Unit Pre-Assessments

**Dear Staci: Is there a pre-assessment for all the units?**

**Staci:** Yes, there is a pre-assessment for all the units. They are all located within the materials on the Carbon TIME webpage. The pre-assessment and post-assessment are the same test, just make sure you remember to keep the pre and post tests separate.

Tapes

**Dear Staci:** What is the wiki URL?

**Staci:** [www.carbontime.wikispaces.com](http://www.carbontime.wikispaces.com)

Gift Cards

**Dear Staci:** I bought a few gift cards for my students for participating in the interviews. What should I do with the receipts?

**Staci:** Mail the receipts to me and will make sure you are reimbursed. The sooner the better! I will also post the gift card receipt on the website.
Hello! My name is Holly James and I am currently teaching 7th and 8th grade science at Lawton Middle School. I have a husband and two children and a black lab. I graduated from Western Michigan University with minors in integrated science and social studies. In my spare time I love to run.

I was introduced to the Carbon TIME project via Marcia Angle. I am excited to be a part of this project. It has been great so far! I look forward to continuing our work here at Lawton, and providing data on the research that we do.

One of the most exciting things about the Carbon TIME project is the "breadth and depth" of the project. The labs cross many science expectations for the year, so we can always refer back to them. Also, the labs are very "real-world" oriented. Kids are able to easily integrate what they learn to their schemata. I am thrilled to be a part of this ongoing project!

Welcome Holly!

Science Resources

**Project Bud Burst** is a network of people across the United States who monitor plants as the seasons change. This citizen-science project focuses on the collection of important ecological data based on the timing of leafing, flowering, fruiting and fall colors of plants. The data are being collected in a consistent manner across the country so that scientists can use the data to learn more about the responsiveness of individual plant species to changes in climate locally, regionally, and nationally. Plant data from 2007-2011 are available on the website. While your classes are thinking about plants, this might be an interesting project to pair with talk about photosynthesis and respiration zoomed out to a regional and seasonal scale. [http://neoninc.org/budburst/](http://neoninc.org/budburst/)

This image from the website shows the reports of the plant leafing-out in 2011.

**Carbon Tracker Simulation**

Here’s a video of the distribution of CO₂ in the atmosphere on a global scale over time from NOAA. This simulation allows students to see both seasonal variation in CO₂ and also short-term patterns due to weather. The video also illustrates how well mixed CO₂ is in the troposphere, for example CO₂ emitted in the USA can reach Asia in a couple of weeks. This video could be used to relate photosynthesis to global carbon cycling. Student could watch the video and observe what time during the year the amount of CO₂ in the atmosphere the lowest and highest in the northern hemisphere? Have students think about what is different about those two parts of the year in terms of plant functioning. During the summer months, CO₂ concentrations decrease in the northern hemisphere due to increased plant photosynthesis. This provides a nice visual link to Keeling Curve graphs and to global carbon cycles. ([http://www.esrl.noaa.gov/gmd/ccgg/carbontracker/weather_movie.html](http://www.esrl.noaa.gov/gmd/ccgg/carbontracker/weather_movie.html))
Reminders

- Please remember to send in your tapes of student interviews, along with any unit pre/post tests.
- Don’t forget to visit your wiki page regularly to record your progress and suggestions for the units. Your feedback is greatly appreciated!

Project Contributors:

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Li Zhan: Graduate Research Assistant, Michigan State University

Carbon TIME Comics

According to the IPCC, energy supply contributes over a quarter (25.9%) of carbon emissions followed by industry (19.4%), forestry (17.4%), agriculture (13.5%), transport (13.1%), residential and commercial buildings (7.9%), waste and wastewater (2.8%)

Trivia Answer

D Energy production