

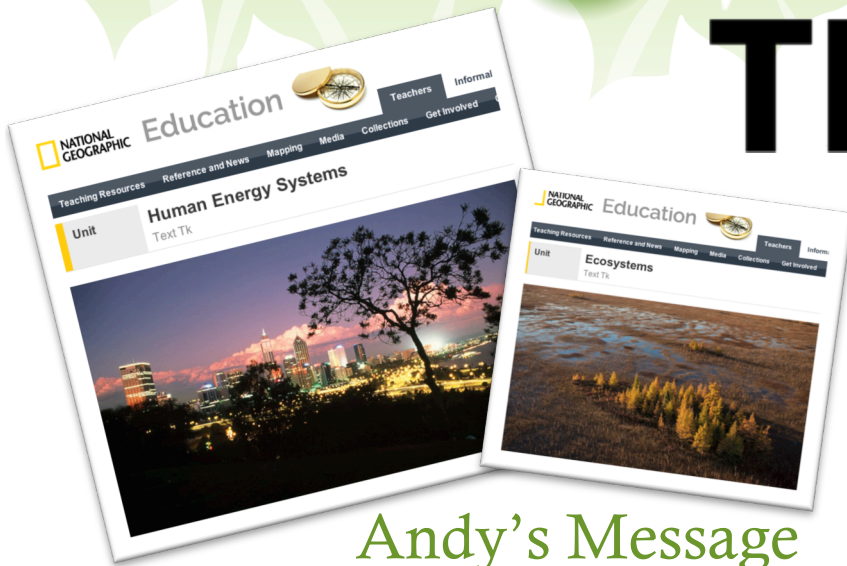
JANUARY 2014

A newsletter for members of the  
Carbon TIME environmental  
literacy project

The



# arbon TIMEs



## Andy's Message

Hi Folks—

It seems like we have been developing, and revising, and field testing *Carbon TIME* units forever, but the end is in sight! We are starting the final revisions of the units. This winter and spring we will be working on the organism-scale units: *Systems and Scale* in January, *Animals* in February, *Plants* in March, and *Decomposers* in April. Then we will be revising the large-scale units, *Ecosystems* and *Human Energy Systems*, in May and June.

We're planning to have an "almost final" version available on the National Geographic website by the beginning of school, then complete final revisions before it's officially rolled out on the website in early 2015.

As we have mentioned before, one of our primary data sources in doing revisions is the comments that you send us through the feedback forms on the NREL websites and your E-mail communication with us. So keep those comments coming. We'll be using them!

--Andy

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## NGSS Webinar

If you are free on the afternoon or evening of Tuesday, February 11<sup>th</sup>, Carbon TIME's very own Andy Anderson and Jennifer Doherty will be leading an NSTA webinar at 6:30 ET called *NGSS Core Ideas-- Ecosystems: Interactions, Energy, and Dynamics*. See more on page 3.

## Reminder

Remember to look out from emails from Rose about scheduling an interview. This is an important part of feedback for us as a research team – your input is important!

## NGSS at the Michigan State Board of Education: A Trip to the Capital

On December 17, 2013, members of the Carbon TIME research team participated in a Michigan Board of Education public comment meeting. Hannah Miller, Wendy Johnson, Sarah Stapleton, and Allison Freed spoke in support of Michigan's adoption of the Next Generation Science Standards (NGSS).

The support was necessary after House Bill 4972 was introduced to the Michigan House of Representatives in September 2013. The bill states that "[t]he state board model core academic curriculum standards shall not be based on the Next Generation Science Standards." In addition, the bill would ban the state board of education and the state department of education from adopting, implementing, or aligning assessments to the NGSS, and prohibit all state officials and agencies from participating in implementing the NGSS ("Anti-NGSS Bill," 2013). The bill was introduced because of opposition in the state congress to the standards addressing global climate change and the human role in the changing climate. Michigan Science Teachers Association and other grassroots organizations such as Michigan Climate Parents initiated our participation in the public comment meeting. Overall, it was a positive and empowering experience for the Carbon TIME members.



Hannah thought the experience was interesting. *"We had a chance to meet the Michigan State Teacher of the year (also a member of the board), who suggested that helping the policy makers understand the wide range of features of NGSS was more*



*important than focusing only on the Michigan representatives' opposition to the climate change portion of the standards, which was helpful to know. It was great to see so many teachers and students speaking on behalf of NGSS as a result of organizing and action from the "Climate Parents" group! It was exciting to be a part of the conversation."*

Wendy also appreciated the experience.

*"I was very impressed with how attentive the board members were during public comments. There were a number of commenters speaking on a variety of issues, and I felt like board members genuinely wanted to hear what each of us had to say. I would highly encourage teachers to share their concerns and their insights with the board and especially to urge them to adopt the Next Generation Science Standards."*

The board seemed to appreciate our willingness to share our opinions and our support for the NGSS in Michigan schools. Based on our continued correspondence with Climate Parents, the adoption and implementation seems likely in the next few months. For more about the Next Generation Science Standards, check out our new NGSS Corner column on page 3.

*Anti-NGSS Bill Introduced in Michigan* (September 19, 2013). Retrieved from <http://nctse.com/news/2013/09/anti-ngss-bill-introduced-michigan-0015053>.

## What is BEAR and What Does BEAR Do?

One of the big questions we ask as Carbon TIME researchers is: *Are students learning how to use principles to explain the carbon cycle?* As Carbon TIME teachers, you teach your students Carbon TIME Units and then give your students lots of tests to help us answer this question. To make sure that these tests are giving us information about student learning that is most helpful, we design them with the help of our partners at the Berkeley Evaluation and Assessment Research (BEAR) Center at the University of California Berkeley, Karen Draney, Hyo Jeong Shin, and Jin Ho Kim.

An important goal when designing tests is to make sure the tests are testing what we want them to test! We want to know how students understand the principles of matter and energy conservation in the carbon cycle, not how well they can read or write, or if they know a lot about gardening but not a lot about forests. BEAR helps us do this by checking for quality and validity of the questions. Then, we use the statistics BEAR gives us about quality and validity to answer questions like: *do students perform similarly on*

*photosynthesis questions about tomatoes and photosynthesis questions about oak trees? Do students perform similarly on multiple choice and open-ended cellular respiration questions?*

After the tests are designed, your students participate in learning the Carbon TIME units, and the tests are taken, we have to analyze the data from the pre and posttests. At MSU we read all of your students' explanations and assign each explanation a learning progression level (from 2 to 4). After we code the students' answers, we send them to BEAR. They use a computer program to put all of this information together and see who is learning what. With the information they give us, we are able to revise the tests to make them better, revise the curriculum so students learn more, and publish our findings so other researchers, teachers, and curriculum developers can learn from our experiences.

The BEAR Center does modeling, statistics, assessment, and analysis for many educational projects in addition to Carbon TIME. You can learn more about BEAR at their website: <https://bearcenter.berkeley.edu/projects>.

## NGSS Corner: Notes and News about the Standards

Since the release in 2013, states have begun to adopt the Next Generation Science Standards (NGSS). The NSTA reports that the orange states (in the image on the right) have already adopted, and the states colored in blue have taken steps to consider adopting. Fingers crossed that Michigan will become an orange state soon!

As a Carbon TIME teacher (especially those living in orange and blue states), you may be interested in knowing more about how each unit in the Carbon TIME curriculum aligns with NGSS. Make sure to download the document called "Mapping Carbon TIME Units onto NGSS" on the NGS website (see link on page 4). Because the units were designed to align with the NGSS, Carbon TIME teachers are contributing to the implementation of the NGSS in science classrooms all over the country. Thanks for this important work!

If you are free on the afternoon or evening of Tuesday, February 11<sup>th</sup>, Carbon TIME's very own Andy Anderson and Jennifer Doherty will be leading an NSTA webinar at 6:30 ET called *NGSS Core Ideas-- Ecosystems: Interactions, Energy, and Dynamics*. You can register for the 90 minute webinar here: [http://learningcenter.nsta.org/products/symposia\\_seminars/Ngss/webseminar36.aspx](http://learningcenter.nsta.org/products/symposia_seminars/Ngss/webseminar36.aspx)

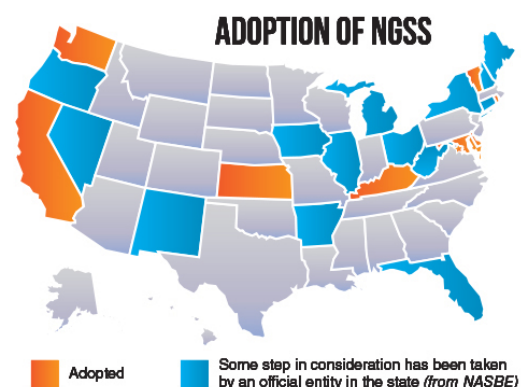


Photo Credit: [ngss.NSTA.org](http://ngss.NSTA.org)



## Spotlight on the undergraduate

Say hello to Carly Atkinson, a new addition to the Carbon TIME research team. Carly is a pre-service science teacher currently in her senior year at Michigan State University where she is majoring in earth science and secondary education. While she finishes her classes and prepares for student teaching, she is also doing lots of work for Carbon TIME coding, preparing research materials, and assisting our project manager, Staci. Carly is originally from Ionia, Michigan, which Carly tells us is home to the Ionia Free Fair (the world's largest) which lasts 10 days each summer and offers a variety of free activities for people of all ages. Carly joined the Carbon TIME team to gain research experience, and says "I have used knowledge I have learned from coding and working on the project to create my own lesson plans, and for many things in my classes." One fun fact about Carly is that she loves rocks, minerals, and gems – she even went gem mining this summer and made a ring from a piece of quartz she found. After Carly graduates, she plans on being a middle or high school science teacher. We're glad to have you on the team!



Welcome, Carly!

## Links You Need

Testing Website and Dashboard:

<http://ibis-live.nrel.colostate.edu/MSP/home.php>

- Give feedback
- Order Materials
- Shipping information

Group Spaces Workshops:

[www.groupspaces.com/CarbonTIME](http://www.groupspaces.com/CarbonTIME)

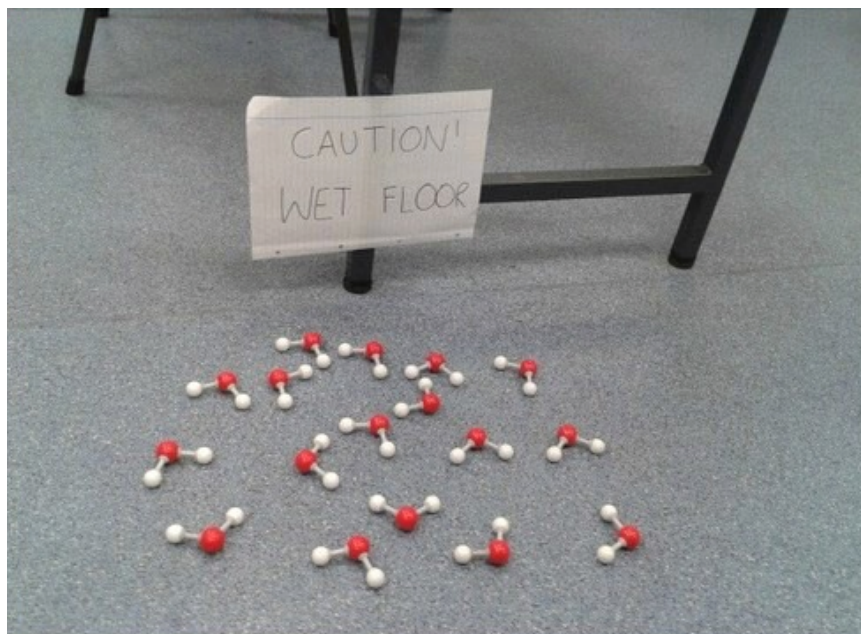


Find us on Facebook: Email Staci ([sharpst5@msu.edu](mailto:sharpst5@msu.edu)) to request to join our group.



Follow us on [Twitter](#):  
@CarbonTIME

# Carbon Comics



Science Teacher Humor

National Geographic Website (you can find the document about NGSS and Carbon TIME alignment here):

[http://education.nationalgeographic.com/education/msu/carobontime/staff/?ar\\_a=1](http://education.nationalgeographic.com/education/msu/carobontime/staff/?ar_a=1)

Videos on the National Geographic website:

[http://education.nationalgeographic.com/preview/education/media/growing-plants/?ar\\_a=1](http://education.nationalgeographic.com/preview/education/media/growing-plants/?ar_a=1)

MSU Teaching Materials (Now with the new *Ecosystems* and *Human Energy Systems* Units animations):

[http://edr1.educ.msu.edu/environmentallit/publicsite/html/CarbonTIME1314\\_unit\\_zip\\_files.html](http://edr1.educ.msu.edu/environmentallit/publicsite/html/CarbonTIME1314_unit_zip_files.html)