This photo was taken June 23, 2008 in the Alaskan Range while working on a “flightseeing” book. The Alaskan Range has some of the most severe alpine routes in North America, and heavy snow accumulations can cause avalanches tumbling toward glaciers below. The geologic events that have taken place in and around the Alaskan Range have resulted in a landscape of unusual beauty. Cold temperatures at the peaks of the Alaskan Range keep the snow and ice from melting. Windchills as low as -59°F (-50°C) have been recorded in the summer and -118°F (-83°C) in the winter. This photo was taken by Gary Gullett using a Nikon D300, 48mm, ISO200, 1/2000th, F10. To see more of Gary’s photos, go to www.PhotoSafariNetwork.com

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Abstract

The Center for Microbial Oceanography: Research and Education (C-MORE) is a National Science Foundation-sponsored Science and Technology Center. Science Buzz is an online platform that posts current research results on newsworthy science, and encourages online conversation among scientists, students and the general public. Students can practice science-style thinking and questioning as they read and write comments in response to Science Buzz posts. This article presents C-MORE’s experience in using Science Buzz as a vehicle to communicate cutting-edge research results in plain language for teachers, students and the general public.

Introduction

Put yourself in a science teacher’s shoes...well, I guess you’re already there! We know the context of what our job is. Through various national and state standards, society is calling upon us to increase the scientific literacy of our future citizens. Scientific literacy goes beyond simply learning scientific facts. It involves reading and understanding articles about science, and critically evaluating the arguments presented (National Research Council, 1996). Implicit in science literacy are good thinking, reading and writing skills (Singletary, 2010). This article addresses the question: How can science teachers integrate reading and writing opportunities into science courses?

Now let’s trade shoes and put on the closed-toe, rubber-soled shipboard shoes of oceanographers working at C-MORE, a Science and Technology Center (STC) established in 2006 by the National Science Foundation. From the very beginning, as the “E” in C-MORE implies, education has been an integral part of the Center (Bruno et al., 2008). A key focus of C-MORE’s outreach program is conveying the critical importance of marine microbes and the roles they play in marine ecosystems. This can be challenging! Microbes are not exactly the charismatic megafauna that tend to engage the public’s attention. C-MORE scientists generally communicate their research results through technical journal articles geared toward professionals. It may be years, before some of the most important discoveries find their way into science textbooks.
In recent years, there has been a growing awareness among scientists and educators that this simply isn’t good enough. Betts (2011) suggests that research results be accompanied by a “plain English” translation for public consumption (also see www.washingtonpost.com/blogs/capital-weather-gang/post/should-technical-science-journals-have-plain-language-translation/2011/06/22/AGhiY8fH_blog.html). So, until that happens, how can scientists convey their research results in a timely fashion directly to the general public, including students and teachers?

Here, we describe an online platform that promotes scientific communication and literacy. C-MORE (and other) scientists can share their research results with the general public in “real time”. Students and teachers can freely access research results on a variety of scientific topics, post comments, ask questions and engage in online discussions with the scientific community.

### Science Buzz and C-MORE

**World’s Greatest Dinosaur Hunter, Aerogel (Space Jello!), and Discoveries from 1000 Miles at Sea** — these aren’t typical titles from science textbook readings. But they are, in fact, headlines from blog posts on Science Buzz.

Since 2004, the Science Museum of Minnesota has been operating Science Buzz with a focus on newsworthy science, cutting-edge research, and seasonal science. However, Science Buzz is not just a source of science information; it also stimulates and solicits contributions from its readers. The website reads: “As long as a post falls under our broad definition of current science, we’re comfortable with difficult questions and a variety of opinions.” Contributors are cautioned to “play nice” by following the Science Buzz Community Guidelines (http://www.sciencebuzz.org/community_guidelines_0). Teachers, students, and the general public can access Science Buzz from any computer hooked up to the Internet, as well as through kiosks in a number of museums across the country (e.g., California Science Center in Los Angeles, North Carolina Museum of Life and Science, Durham, and the Oregon Museum of Science and Industry in Portland).

In the Fall of 2010, C-MORE began to establish a Science Buzz presence. C-MORE encourages its scientists to post their research directly on Science Buzz under the pseudonym MicroScribe. Thirteen posts and bursts (shorter posts) on C-MORE related research are currently available. C-MORE also engages a retired science teacher (the lead author) to work with scientists to blog about their research:

> “Here are the steps in my writing process. I begin by reading papers published in professional journals by C-MORE scientists. An example is the Coleman and Chisholm (2010) article on comparative population genomics. My goal is to translate the science content for a teenage audience while preserving the essence of the research. I work (usually via email) with the scientists. I develop a draft, including graphics and links. I go back and forth with C-MORE Education Director Barbara Bruno and the other scientists to sharpen accuracy. As soon as we finalize the product, I post it online. My Science Buzz posting of Coleman and Chisholm (2010) appeared as ‘Pacific versus Atlantic: Discovering Micro Differences’ (www.sciencebuzz.org/blog/pacific-versus-atlantic-discovering-micro-differences). Any updates or corrections can be made immediately. The number of readers climbs over the hours and days ahead.”

— Barbara Mayer
Science Buzz in the Classroom

Science Buzz provides an opportunity for students to develop the reading, writing and thinking skills that constitute scientific literacy. A hallmark of scientific thinking is skepticism. When scientists attend seminars or read professional articles where research results are announced, they tend to assume a questioning mindset. While being respectful of their colleagues, they ask: Was there a control? Was the sample size large enough? How would the results have been different if...?

As students read Science Buzz blog posts, teachers can help students develop a respectful, questioning attitude. Science Buzz selections could be used before, during or after more classic classroom activities or assignments. For example, a teacher could assign a relevant post for all students to read to introduce a new unit. Alternately, each student could select a post based on individual interest as an extension activity. Perhaps students could work as partners in their reading, utilizing a proactive, interactive and reflective process (Gillis and MacDougall, 2007). After reading and discussion, the next step would be for students, individually or with a partner, to compose a short comment in response to the Science Buzz blog. These rough drafts should be submitted to the teacher for approval before being posted online as comments on Science Buzz.

Science Buzz supports educators’ needs in various ways:

- attractive, engaging appearance -- Colorful, clear graphics; snappy headlines; short, light writing style...who wouldn’t want to read Science Buzz?! The website is not an online textbook; it’s written in an informal style for a young, Web-savvy audience.
- user-friendly environment -- As an online discussion community, Science Buzz can provide a transition learning experience for shy students, who may be reluctant to enter into classroom discussion (Brunsell and Horejsi, 2010).
- mindful of science standards -- Each Science Buzz blog post lists appropriate “Science Topic Areas,” the phrase for Minnesota’s science standards as of 2010.
- long-term presence -- Scientific investigations frequently utilize blogs for short-term reporting of field experiences and results. Science Buzz, however, has maintained a continual Web presence since 2004.
- quality science content -- As an NSF-supported entity, Science Buzz features emerging science from respected research institutions.
- inclusive -- Science Buzz utilizes JAWS screen reader to assist individuals who are blind or have low vision.

Science Buzz can be a major arrow in the quiver worn by science teachers. Let the online discussions begin!

References


Additional Online References

C-MORE: cmore.soest.hawaii.edu/information.htm
Science Buzz (general website): www.sciencebuzz.org/blog
Science Buzz (reports by C-MORE’s MicroScribe): www.sciencebuzz.org/blog/authors/MicroScribe
Should technical science journals have plain language translation?: www.washingtonpost.com/blogs/capital-weather-gang/post/should-technical-science-journals-have-plain-language-translation/2011/06/22/AGhiY8FH_blog.html

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Why should I open and read the NESTA ENews emails?

NESTA’s monthly ENews provides brief summaries of stories and projects that have a direct link to the Earth Sciences and or the teaching of Earth Sciences. Many of these short articles provide links to more information or complete websites that those interested can follow. The ENews also contains information regarding teacher opportunities for research, professional development, and even grants. The reader will also find a calendar with items that have time critical information or may be occurring later that month or the next month. The ENews will also be adding state related links each month. The goal is to provide links to two states’ Earth Science sites each month. For example, in the June 2011 issue we focused on Earth Science resources in Alabama and Colorado.