



National Association of Geoscience Teachers
Southeastern Section Newsletter
Winter-Spring 2008

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NAGT

www.nagt.org

SE-NAGT

<http://www.gpc.edu/~pgore/nagt/se-home.html>

Geological Society of America

www.geosociety.org

US Geological Survey

www.usgs.gov

Earth Science Week

www.agiweb.org

www.earthscienceworld.org

www.earthsciweek.org

**Summer-Fall 2008 Newsletter
Deadline:**

August 15, 2008. Please send
news items to Bill at

wITHERSPONB@FC.DEKALB.K12.GA.US

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President's Report

Election

This newsletter marks the end of my second year as President of the SENAGT. All organizations need regular changes in leadership to stay current and vibrant, and ours is no exception. Two SENAGT offices will be filled through balloting this spring; Andy Rindsberg has agreed to serve as our new Vice President and Bill Witherspoon will officially become our Newsletter Editor. I have had the privilege of getting to know Bill and Andy over the years, and I have witnessed their skills as both geologists and educators. SENAGT is very fortunate that they have agreed to step forward and accept leadership positions within our organization. [*Ed. note: biographical sketches and voting instructions follow this President's report.*]

OEST Award

As many of you know, the Outstanding Earth Science Teacher Award, sponsored by NAGT, has been a focus of my attention as President of the SENAGT. Historically our organization has had trouble awarding winners in all of our member states, but this last year we achieved a long desired goal; the 2007 OEST award was presented to a teacher in each of our regional states! Let's all work to make sure we repeat this wonderful accomplishment; all of us come into contact with exceptional elementary, middle and high school earth science teachers, and now is the time to nominate them for the 2008 OEST award. Use the form included in this newsletter to nominate a teacher and send the form on to your state representative. Their contact information is also included in this newsletter.

SENAGT at SEGSA Charlotte

The 2008 meeting of the Southeastern Section of the Geological Society of America will take place this April in Charlotte NC. Several of our members have been involved in planning and organizing this year's SEGSA, and many of us will be making presentations at various sessions and workshops at the meeting. The annual SENAGT business meeting will be held at 12:15PM on Thursday April 10th in the dining room of the host hotel, the Hilton Charlotte University Place. Everyone is cordially invited to attend this meeting, especially officers and state representatives. We will use this time together to discuss current section business and plan SENAGT sponsorship of future sessions, workshops and field trips. I hope to see you there.

Nan

Nan Huebner
Atlanta, GA
March 2008

Elections

SENAGT is holding an election to fill two vacant positions: Vice President and Newsletter Editor. Voting is simple and will take only a couple of minutes of your time. Simply visit <http://www.gpc.edu/~pgore/naqt/ballot2008.php>. You may vote for the nominee or write in your choice of candidate. Following is a biographical sketch of, and a statement of interest from each nominee.

For Vice President: Andrew K. Rindsberg

Environmental geology; paleontology.

Education: BS Geology, Stanford Univ; MS Geology, Univ Georgia; PhD Geology, Colorado School of Mines.

Professional Experience: University of West Alabama, Associate Professor 2006-present; Geological Survey of Alabama, 1989-2006; Southeastern Missouri State University, Assistant Professor 1987-88; Auburn University, Assistant Professor 1985-86, 1988

Professional Affiliations: NAGT for nearly 20 years; Ala. Acad. Science, Ala. Geol. Soc. (Secretary/Editor 1990-92, Editor 1997), Ala. Natural Hist. Soc., Ala. Paleontol. Soc., Birmingham Paleont. Soc., Conchologists of Amer., GSA, Nature Conservancy of Ala., Paleont. Soc. (Chair of Southeastern Section, 2005), Sigma Xi, Society for Sedimentol.

Service: Fossils of the Black Belt (annual workshop for high school teachers), 97-present. Coeditor, Ichnology Newsletter, 98-04. Salvage paleontology team member, resulting in publication and preservation of Union Chapel Mine tracksite (Ala.), 00-05. Manuscript and grant proposal reviewing.

Research Interests: Ichnology, molluscan paleontology and geomorphology of Southeastern Coastal Plain, natural history education

Statement of Interest: "For the past twenty years, I worked on projects involving Alabama geology (including mapping), hydrogeology, paleontology, and coastal sedimentology. Now I make use of this experience in teaching environmental geology to biology and environmental science majors. The University of West Alabama teaches future teachers in a poor section of a poor state, and we are constantly planning how to make the most impact given limited resources. I will apply the same kind of thinking to SENAGT."

For Newsletter Editor: William D. Witherspoon

Dr. William (Bill) Witherspoon, who received his PhD in Geology in 1981 from the University of Tennessee, Knoxville, is an instructor in Fernbank Science Center of the DeKalb County Schools. He teaches geology in the highly regarded Scientific Tools and Techniques program for ninth graders. He has developed numerous geology activities for K-12 students, including an activity on the Grand Canyon and geologic time which is now part of the Digital Library for Earth Science Education (DLESE). His Advanced Studies courses for eleventh and twelfth graders have focused on human impacts on the physical environment.

As co-author of the Georgia Performance Standards (GPS) for the new Earth Systems course for high-school students and Frameworks for both sixth grade Earth Science and Earth Systems, Bill is a member of the Science Education Advisory Committee of the Georgia Department of Education.

He has conducted numerous field-oriented teacher-training workshops, most recently co-leading a two week workshop for 15 Georgia Earth Systems teachers, funded by the U. S. Department of Education.

Statement of Interest: "I am honored to be serving as your Interim Newsletter Editor following Stan Dunegan's more than five years of service. I see communication as the lifeblood of our organization. If I become Newsletter Editor, I will continue to encourage a lively exchange by a growing number of voices as we work together to improve public understanding of the Earth."

Michael Gibson Wins Top NAGT Award

Citation by Don W. Byerly, Professor Emeritus
Department of Earth and Planetary Sciences
The University of Tennessee

[Ed. Note: At October's Geological Society of America and NAGT National Meeting in Denver, Professor Michael Gibson, SENAGT Past President, received NAGT's Neil Miner Award. Professor Byerly gave the following citation.]

The Neil Miner Award, established in 1953 by the National Association of Geoscience Teachers, recognizes those who have made exceptional contributions to the stimulation of interest in the earth sciences. The person I cite to you today certainly measures up to the standards set forth by the namesake of this prestigious award, Neil Miner.

Madame president, fellow NAGT and GSA members and guests, it is my pleasure to present Michael A. Gibson as the recipient of the 2007 Neil Miner Award. David Dale Owen, Pioneer American Geologist, (1807-1860) once stated, *"A mind alive to natural science finds even in the sands of the seashore a lesson, and in the pebble by the brook a subject for contemplation."*

That observation by David Dale Owen over a century and a half ago during the early stages of our science truly epitomizes Michael's alive mind and love for earth science. Michael's present role is professor of geology in the Department of Geology, Geography, and Physics at the University of Tennessee at Martin.



Our honoree grew up in Williamsburg, Virginia in the shadows of the College of William and Mary where he matriculated with a B.S. degree in geology in 1979. He traveled to Auburn, Alabama for an M.S. degree in 1983, and when I met him he had just enrolled at the University of Tennessee where he earned his Ph.D. degree in 1988.

Michael wound up in my class on local stratigraphy in 1984. It did not take long for him to impress me as someone with a deep interest in everything that geology has to offer. It is often said that perception is reality - there is no doubt that my perception of Michael was right on. While at UT his star shone brightly as he received the Cardin Fellowship for Academic Excellence, the UT Knoxville-Oak Ridge National Lab Science Alliance "Super" Research Fellowship for Academic Excellence, the University of Tennessee Chancellor's Citation for Extraordinary Professional Promise, and the Department of Geology Incentive Award. He has truly lived up to and exceeded everything those awards predicted and, so far, certainly everything I expected him to accomplish. I say so far, because he is like the battery bunny commercial - he refuses to run down. He never ceases lending leadership to earth science related organizations, mentoring students and K-12 teachers, engaging in meaningful research in a wide variety of research topics, including science education, and fulfilling his academic institution responsibilities. I have often wondered how he manages to keep a kettle full of all these endeavors stirred, but he does and, I might add, enthusiastically.

Michael has long lists of publications, papers, and grants relative to both educational and geological research interests. The lists related to his geological research focus mainly on the paleoecology, paleoenvironmental reconstruction, and biotic interaction analysis of the Middle Paleozoic and Cretaceous of West Tennessee and the Pennsylvanian of Alabama. His research and publications also cover the geology of Belize, Central America; and the history of geology in Tennessee. His educational interests are primarily focused on: teaching the history of Earth and life; fostering undergraduate research experiences, developing techniques for improving information content and retention in the classroom, imparting paleontology to non-science majors and non-traditional students; and improving K-12 Earth Science education.

Michael has not isolated himself on the Martin Campus of West Tennessee. He has a commendable record of supporting the professional organizations and societies related to science. Let me mention just a few salient contributions he has made through the years. Currently he serves the Geological Society of America as SE Section Education Coordinator; he has served in numerous capacities for the Tennessee Academy of Science; he is the National Education Chair of the Paleontological Society; he has been a councilor for the Society of Sedimentary Geologists (SEPM); he is past president of the UT Martin Chapter of Sigma Xi; and last but not least, he has been serving the National Association of Geoscience Teachers in admirable fashion. Michael is a past president of the Southeastern Section of NAGT, a past Counselor-at-Large on the National Executive Committee, is currently serving as the Education Coordinator for Tennessee, and is the chairperson of the OEST selection committee.

Besides being a friend for many years Michael has become a close colleague and collaborator in a continuous campaign to promote earth science in Tennessee as well as at the national level. This relationship began while conducting field-oriented workshops for K-12 teachers, and ultimately evolved into development of an organization called Tennessee Earth Science Teachers (TEST). Michael's role as an advisor has helped facilitate TEST into an organization highly respected by the Tennessee Science Teachers Association as well as the Tennessee State Department of Education. One of Michael's most recent accomplishments at the State level was getting Earth Science accepted as a science unit for entrance into Tennessee's institutions of higher education.

The biography of Neil Miner notes that he was as devoted to his family as he was to his career, his students and his friends. The same can be said about Michael Gibson. Regardless of the all the time and effort he expends doing good works he remains a devoted husband and a nurturing father.

Michael's achievements as a human being, educator, and a scientist are best summed up in the words of a few of the many folks touched by him. Hear first what a few of his former students have to say:

"I feel sorry for anyone who doesn't get the chance to just sit and talk with Dr. Gibson. These people do not know what they are missing. No matter how busy Dr. Gibson is he always has time to take a break and just talk with you and to see how you're doing. Overall Dr. Gibson is a great person, and I'm glad that I got the chance to truly know him".

"Not only is he a great teacher, but he makes you learn without you knowing it. He makes learning fun and hands on".

"I soon changed my major to geology and thus began my 18 year odyssey with Michael as a student and colleague. As a student of Michael's from 1989-1993, I was a witness to and personally experienced his unselfish dedication to students as he taught us how to do geology in the field and in the lab, how to write grants, how to present results at professional meetings, and simply how to function as a real geologist."

Some teachers had these comments to make:

"Dr, Gibson never fails to stretch my boundaries because he always leaves me wanting to know more".

"My first encounter with Dr. Gibson was at the Tennessee Science Teachers Association in a workshop where he discussed the process of getting *Pterotrionia thoracica* recognized as the state fossil. Little did I know the next summer I would spend more time with him than my own family! I signed up for one week of GEO Camp and realized the more I learned, the more I wanted to know. My experience is repeated by many members of Tennessee Earth Science Teachers."

I think Michael Gibson's MO can be best summed up in a tribute to Michael from the chancellor of the University of Tennessee at Martin: "I see in Dr. Gibson a dedicated professional who genuinely loves his work with students. He has been instrumental in taking classes to our local high school through our dual credit program that simultaneously offers college-level courses to high school students. Through his efforts, geology is being taught to a new group of students. His teaching in this area is indicative of Dr. Gibson's passion for teaching. His students are engaged, challenged, and motivated in his classes and labs. I wish that I could clone his dedication and love for teaching and research".

Michael, I personally want to thank you for all that you have meant to me - a true friend and colleague in pursuit of spreading the joys of learning and teaching about the Earth. And, I am certain that I speak as well for the countless others whom you have touched with your inquiring and inspirational way. Keep up the good work!

Reflections from an NSTA Regional Conference in Birmingham, Alabama

Bill Witherspoon

In December, Nan Huebner and I had the opportunity to attend the Southern Regional Conference of the National Science Teachers Association in Birmingham. I was able to meet our two Alabama representatives, Hurd Finnegan and David Kopaska-Merkel. David was helping to staff the booth of the Alabama Geological Survey, which was busily giving away posters, maps, and fossils and in general promoting goodwill for geologists.



Hurd Finnegan was assisting at two events sponsored by the National Earth Science Teachers Association (NESTA): the rock and mineral raffle and the Share-A-Thon. The latter is an activity in which presenters meet one-on-one with attendees to pass along materials and ideas. There were eleven presenters and 53 attendees..



NESTA Share-A-Thon



NESTA Rock Raffle

Who is NESTA?

I had encountered NESTA previously when NESTA sponsored a popular and useful Share-A-Thon at the NSTA National meeting in Atlanta in 2004. In Birmingham, NESTA's Executive Director Dr. Roberta Johnson generously gave me half an hour of her Friday morning to help the SENAGT newsletter audience to find out more about NESTA.

NESTA was founded in 1983 as a non-profit organization to support and represent K-12 Earth Science teachers (see <http://www.nestanet.org>). NESTA's elected leadership is drawn from K-12 geoscience teachers, reflecting the overwhelming majority of its members. The Share-A-Thon has been a NESTA staple at NSTA national and regional meetings for years. The upcoming Boston NSTA meeting promises to have four Share-A-Thon sessions. For a complete list of the extensive set of activities and sessions NESTA will offer at the NSTA in Boston, see <http://www.nestanet.org/php/conferences.php>.

NESTA's web site has links to the web sites of four state Earth Science Teacher Associations (ESTAs): Michigan, New Jersey, Texas, and Ohio. NESTA will be releasing a new website this Spring, and is piloting a program to help ESTAs develop and maintain websites, which will presumably increase this number. NESTA recently added capability for members to join and renew online through the NESTA website at <http://www.nestanet.org/php/signup.php>. NESTA encourages participation in our OEST program, and Dr. Johnson permitted me to place copies of the OEST nomination form and the Summer-Fall SENAGT newsletter on a table at the two NESTA events.

By Geological Consent

Elsewhere at the meeting, I found inspiration in a talk by textbook author and Washington University professor Michael Wysession, "Civilization Exists by Geological Consent." (Dr. Wysession gave this presentation through the NESTA Advances in Earth and Space Science Lectures at the National NSTA in St. Louis last year, and it is available online at http://www.nestanet.org/NESTA2007_Wysession.ppt.) About 100 people experienced this eye-catching presentation, cataloging the historical and potential effects on civilization of earthquakes, tsunamis, volcanic eruptions, and climate change. I recognized NSTA 2005-2006 president Michael Padilla in the audience. I wished that every K-12 teacher, and especially middle school earth science teachers, could have seen this presentation. As a scientist, I would have preferred that Dr. Wysession had made clearer the boundaries between fact and hypothesis. Nevertheless, the talk, like its title, should be an eye-opener for everyone.



Personal Wish List for Geosciences at Teacher Meetings

Reflecting afterwards, I thought of some goals for every K-12 science teacher meeting at the state or regional level:

- Teachers of all science disciplines crowd into a presentation like “Civilization Exists by Geological Consent,” and come away with a passion to see earth science instruction grow.
- At least one booth in the exhibit hall, like that of the Alabama Geological Survey at this meeting, serves as a focus for burgeoning enthusiasm about geoscience instruction.
- Earth science teachers learn about the OEST program, and are encouraged to self-nominate or to nominate a colleague.
- Every science coordinator grabs an OEST nomination form and begins puzzling out which teacher is best positioned to win the honor for his or her school system.
- Past and future OESTs, and others, share their best lessons at a huge Share-A-Thon that is thronged by earth science teachers.

To me at least, the organizational flags that wave when these goals are reached are of secondary importance. A final note: I have joined NESTA (annual cost: \$20), in part to help keep you informed of its efforts toward the goals we share.

Most recently reported dates of past or future meetings

National Science Teachers Association and Affiliates		
Area	Latest date on web site	City
National	Mar. 27–30, 2008	Boston
Southern	Oct. 30 – Nov. 1, 2008	Charlotte
Alabama	Oct. 3-4, 2006	Birmingham
Florida	Oct. 23-25, 2008	Orlando
Georgia	?Feb. 12-14 , 2009	Savannah
Louisiana	Nov. 1-3, 2007	LaFayette
Mississippi	Oct. 22-23, 2007	Jackson
North Carolina	Nov. 14-16, 2007	Greensboro
Puerto Rico	March 15-16, 2007	Bayamon
South Carolina	Oct. 22-24, 2008	Myrtle Beach
Tennessee	Nov. 21-22, 2008	?Nashville

Geological Societies		
Organization (Area)	Latest date on web site	City
GSA (National)	Oct. 5-9, 2008	Houston
GSA (Southeastern)	Apr. 10-11, 2008	Charlotte
GSA (South Central; incl. LA)	Mar. 29- Apr. 1, 2008	Hot Springs, AR
Georgia Geological Society	Oct. 12-14, 2007	Canton
Carolina Geological Society	Oct. 31- Nov. 2, 2008	Spruce Pine

Regional News in Geoscience Education

Alabama (submitted by David C. Kopaska-Merkel)

Field trips and workshops

The annual field teacher workshop to the Cretaceous of Alabama, hosted by the University of West Alabama and co-led by the Geological Survey of Alabama and Discovering Alabama (educational television series on PBS) was held in October as usual. Leaders included David C. Kopaska-Merkel, Douglas A. Wymer, Andrew K. Rindsberg, and Richard Thurn. We had about 25 attendees and even though it rained on and off all day long, we had a great time in the field. There weren't very many small fossils found because the ground was mucky, but I think all the attendees found things that pleased them. We will run the same trip again this coming October.



David Kopaska-Merkel, Andrew K. Rindsberg, and three teachers identify Cretaceous fossils at a workshop in Livingston, Alabama, and environs.



Bruce Saunders, Thompson High School, Shelby County, won a geologic map of the United States from the Alabama Geological Society.

Dinosaurs and Volcanoes were **BIG** in Alabama this year!

The Anniston Museum of Natural History hosted a replica of "A. T. rex Named Sue" from the Field Museum of Natural History, together with other dinosaurs in their own collection or borrowed from the McWane Science Center.

The McWane Science Center held an exhibit on dinosaurs too. Kudos to James Lamb and Jun Ebersole.

The Birmingham Museum of Art held an impressive show on the eruption of Pompeii, with artifacts from Italy that brought the city back to life and underscored the poignancy of its burial ("Tales from an Eruption: Pompeii").

State Government

I don't have any information about legislative activity or changes to the curriculum this year. Since we are operating with relatively new science standards I don't expect any changes this year. Of course, the state legislature will probably consider another anti-evolution bill. They have done that every year lately, but no such bill has yet come close to passage in this state.

Meetings

The NSTA regional meeting was held the first weekend in December in Birmingham. About 2500 people attended the meeting, which took the place of the annual Alabama Science Teachers Association meeting. There were several geological organizations represented in the exhibit hall, including the Geological Survey of Alabama and a mining and minerals group that gave away free mineral samples. There were workshop sessions on GIS, implementation of research-based curricula, "Civilization Exists by Geological Consent", and others. [Ed. Note: See article elsewhere in this newsletter].

Organizations

The Alabama Geological Society (<http://homepage.mac.com/jpashin/AGS.htm>) conducts an annual field trip and sometimes other educational activities.

The Alabama Paleontological Society (www.alabamapaleo.org) continues its monthly field trips to the Steven C. Minkin Paleozoic Footprint Site (Union Chapel Mine) to rescue Pennsylvanian fossils from this rich ichnologic site. Please contact Ashley Allen for information. The Society also holds other field trips, and monthly meetings with guest lecturers.

The Birmingham Paleontological Society (<http://bps-al.org>) continues to hold field trips and monthly meetings with guest speakers.

Publications

The world still waits for the second edition of *Lost Worlds in Alabama Rocks*. This is the best book about geology of any state in the country [so far – ed.]. The first edition is available from the author, Jim Lacefield, at [lacefiel@hiwaay.net](mailto:lancefiel@hiwaay.net).

Florida (submitted by Jon Bryan)

Evolution in the Sunshine State

This year (2008), the Florida State Board of Education (SBE) was due to approve a revision of its Science Sunshine State Standards, which it did on Tuesday, February 19, with some qualifications. And according to a Florida Department of Education (DOE) press release, "District science curriculum will be aligned to the revised standards beginning in the 2008-09 school year and the Science Florida Comprehensive Assessment Test (FCAT) will begin testing students on the material in 2012."

The first Sunshine State Standards were approved in 1996, and in 2006 the SBE adopted a schedule for the regular review and revision of all K-12 standards. In 2007, the SBE approved revised standards in reading and language arts, and mathematics. The revised science standards were developed by a committee of educators, scientists, business leaders, school administrators and other stakeholders through a comprehensive, year-long drafting and review process that began in May 2007. As part of that process, more than 10,000 individuals provided more than 260,000 ratings and 20,000 comments via a Web-based system. In addition, the DOE held five public hearings throughout the state (Tallahassee, Jacksonville, Miramar, and two in Orlando) to collect public feedback on the standards.

What the Board approved on February 19, by a vote of 4 to 3, was the "Optional Revised Science Sunshine State Standards". According to a DOE press release, "The optional standards consistently applied the terms 'scientific theory' and 'law of' to all appropriate areas throughout the document." The new standards are outstanding, but there has been a very predictable outcry over the primary revision of the new standards that was approved by the board—viz., the consistent reference to biological evolution as a scientific *theory*. The insertion of "theory of" with "evolution" was the accepted compromise with objections that evolution should not be presented as scientific fact. As one newspaper headline put it, "*Evolutionary Controversy Settled, In Theory.*"

The Sunshine State Standards now refer explicitly to "*the theory of...atoms (or atomic theory)...the evolution of the Earth...cells (or cell theory)...evolution...plate tectonics...the Big Bang...electromagnetism... and...the origin of eukaryotic cells (endosymbiosis).*" Also inserted in

various places was “law of”, as in the “*Law of...Gravity (or Universal Gravitation)...and the Conservation of Mass (and Energy)*”.

But even before the insertions of “theory of”, the revised standards routinely referred to cell theory, relativity theory, big bang theory, and the theory of plate tectonics. There seems to have been no problem with these theories. In fact, the original (unmodified) revised standards even refer to evolution as theory. One benchmark standard requires students to “*Recognize that fossil evidence is consistent with the theory that living things evolved from earlier species.*” Nevertheless, the decision to consistently insert “*theory of*” in front of “evolution” was judged to be a major setback by many educators and scientists.

We all know why there were public demands to insert “theory of” next to evolution, and we know why so many educators and scientists did not want to refer to evolution as a theory, but rather as a matter of fact. We also know that a proper understanding of the nature of scientific theory is not held by many in the general public. But the Optional Revised Standards that were adopted by the SBE on February 19th are entirely appropriate, accurate, and acceptable (with one exception—the “theory of the evolution of the Earth” is unfortunate since the phrase refers to no particular theory). The only real problem is not the public misunderstanding of scientific theory (although this is a problem), but the fact that in counter-arguing that “theory of” evolution be left out, scientists and science educators capitulated to the popular, faulty definition of theory.

The popular misunderstanding of theory is that the word is a qualifier, meaning “we think, maybe, it might be like this, but of course it could just as well be explained in some other way.” It’s a guess, even an educated guess, but not to be confused with fact. Scientists know how wrong this is, but if the general public does not understand what a scientific theory is, then at least part of the blame lies with science educators. There is nothing wrong in principle with referring to evolution as a scientific theory—that is precisely what it is.

Scientific theories are not guesses, nor even educated guesses. Theories are the best known explanations of certain facts. They are more than just successful hypotheses. Theories are constructs of many answered questions. They are broad, comprehensive explanations of much data, some of which may seem at first to be unrelated. Good theories make testable predictions, and they are fruitful, stimulating further research. And because of all of the above, scientific theories are *compelling*—they are believable as true or closely approximating the truth. Scientific theories must also be potentially falsifiable, but disproof becomes increasingly unlikely as support for the theory continues to accumulate—or more accurately, as new observations are successfully and convincingly explained by the theory. In most cases, older theories are not proven to be entirely wrong, only limited in scope and application (e.g., Newtonian physics after relativity theory, or continental drift after the theory of plate tectonics).

But in fact, the Florida standards do an outstanding job in defining scientific theory. For example, some of the benchmark standards include these definitions:

Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life.

Identify that a scientific theory is an explanation of nature supported by evidence.

Recognize that a scientific theory is an explanation of nature.

Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.

Recognize that a scientific theory is developed by repeated investigations of many scientists and agreement on the likely explanation.

Recognize that scientific theories are supported by evidence and agreement of many scientists.

Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.

And in all grades (K-12), the following standards on the nature and practice of science are reiterated:

Standard 1: The Practice of Science A: *Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.* B: *The processes of science frequently do not correspond to the traditional portrayal of "the scientific method."* C: *Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge.* D: *Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.*

Standard 2: The Characteristics of Scientific Knowledge A: *Scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world, but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as art, philosophy, or religion.* B: *Scientific knowledge is durable and robust, but open to change.* C: *Because science is based on empirical evidence it strives for objectivity, but as it is a human endeavor the processes, methods, and knowledge of science include subjectivity, as well as creativity and discovery.*

Standard 3: The Role of Theories, Laws, Hypotheses, and Models *The terms that describe examples of scientific knowledge, for example: "theory," "law," "hypothesis" and "model" have very specific meanings and functions within science.*

So no more whining over the public rejection of evolution! Let's instead get to work explaining the true nature of science and scientific theory, and persuading our students and the public by the evidence for scientific theories. If we cannot do that, and if we cannot adequately address public concerns and misunderstandings over evolution, then we have failed as educators—at least in theory.

Georgia (submitted by Bill Witherspoon)

Georgia Science Teachers Association Meeting

In February, the Georgia Science Teachers Association held its 50th anniversary meeting in Athens. There were over 200 presentations and events to choose from, including over 40 addressing Earth Science.

In one of the sessions, high school teachers who participated in last summer's two-week workshop, *Earth Systems and the GPS*, presented classroom activities they had developed as a result of the workshop.

Kathryn Kornberg and Richard Scott showed slides of their Earth Systems class at Southeast Whitfield County High School (right) creating a graphic geologic timeline.

OEST Nomination forms were distributed to the presenting teachers and to attendees.

In another session, the Georgia Department of Education gave an update. It was announced that a new curriculum framework for the middle school science standards would be ready in May. This framework is being offered as an alternative to, rather than a replacement for, the framework released last year.



At the awards banquet, a poster display recapping GSTA history included a photo of a young Dr. Pamela Gore giving out the OEST award sometime in the 1980's, as she did once again at this year's banquet. (I was the grateful recipient.) I came away impressed that for some of our leaders, making contributions to K-12 geoscience education has been nearly a lifelong habit.



GSTA Convention Scenes



Professor Emeritus David Wenner of the University of Georgia led a walking geology field trip of the campus for teachers.

Louisiana (no information submitted)

Mississippi (no information submitted)

North Carolina (submitted by Randy Bechtel)

GSA and NSTA to Hold 2008 Regional Meetings in Charlotte

The Southeastern Section of the Geological Society of America (GSA) is holding its 57th Annual meeting in Charlotte, North Carolina April 10-11, 2008. For more information go to:

<http://www.geosociety.org/sectdiv/southe/08mtg/index.htm>

Also in Charlotte this year, the North Carolina Science Teachers Association (NCSTA) will be hosting the National Science Teachers Association (NSTA) Southern Regional meeting, October 30-31, 2008.

For more information see: <http://www.ncsta.org> or <http://www.nsta.org/conferences>.

NC Science Teachers Association Professional Development Institute (NCSTA-PDI)

Because the NCSTA is hosting the regional NSTA meeting next fall, it will not be running the usual statewide PDI in 2008. Therefore the NCSTA District Directors are holding one-day "drive-in" mini-PDIs across the state during spring 2008. Find the drive-in nearest you:

<http://www.ncsta.org/institute/drivein.html>



Georgia Mineral Society gave away fossils and rocks at its busy booth in the exhibit hall (last booth on left).

Report on the NCSTA-PDI in Fall 2007

The N.C. Geological Survey (NCGS) had a vanload of free material to give away from our exhibit booth, including over 23,000 topographic maps with coverage across the state. The teachers hauled away almost 14,000 of those maps. We plan to make sets out of the remaining maps and distribute them at upcoming workshops. For the second straight year, several sponsors came together to purchase 400 Earth Science Week kits for distribution at the Institute. A big thank you to: Association of Engineering Geologists (AEG), Groundwater Professionals of North Carolina, American Institute of Professional Geologists, Jane Gill-Shaler, Dr. Charles Welby, and Enviro-Equipment.

This material was in addition to the USGS material and the NCGS material we had for distribution at our exhibit booth.

Nominations/Applications for the North Carolina OEST Award in 2008

In North Carolina, there are two Outstanding Earth Science Teacher awards: one for Formal Teachers in the K-12 classroom, and one for Informal Educators (museums, industry, etc.). Any teacher, or other K-12 educator, who covers earth science content with their students, and has not won the award previously, is eligible!

Nominations/Applications for the North Carolina OEST Awards are currently being accepted through April 1, 2008. This award acknowledges an outstanding formal teacher and an informal educator in the earth sciences. For more information go to:

http://www.geology.enr.state.nc.us/proj_earth/proj_earth.html or contact Randy Bechtel at Randy.Bechteln@ncmail.net.

North Carolina OEST Award Winner in 2007

As reported in the previous SENAGT newsletter, the North Carolina OEST award winner in the Formal Teachers in the K-12 classroom Category in 2007 was Sam Fuerst of Northern High School, in Durham. Sam has taught the earth sciences for the last 21 years for Durham Public Schools in North Carolina. He received degrees in geology from UNC and Duke University, then spent 5 years as a consulting geologist and a petroleum geologist for Shell Oil Company. At the age of 32, he went into teaching. He has conducted numerous training sessions for teachers in geology both through the school system and in collaboration with the University of North Carolina. Sam's recent adventures include: developing a website showing a virtual field trip of our state through his Kenan Fellowship (<http://ncsu.edu/kenanfellows/2004/sfuerst/activities.html>), taught a workshop for students working with Mars Rover data, and spent a month on an icebreaker in the Arctic mapping the sea floor. Sam is also very proud of the dozen or so students who have gone on to major in the earth sciences after being in his classes. Congratulations Sam!

In addition to the NAGT prizes, Sam received a \$500 check from N.C. Mining Commission, a certificate for select materials from the NCGS store and a map package from the NCGS focused on his school.

From the North Carolina Department of Public Instruction (DPI)

At its February meeting the NC State Board of Education passed a policy allowing high school credit for high school science courses taken in middle school. This is part of a broader initiative which will allow students to get high school credit for a variety of courses in middle school now including math courses, foreign language and science. The policy will probably include English and Social Studies in the near future. The purpose is to allow high school students to take more advanced high school and college courses during the high school years and aligns with some of the innovative school designs. The most likely science courses to be offered at the middle school level are our Earth/Environmental Science and Physical Science courses.

The K12 Science Section at the Department of Public Instruction is excited about a curriculum development project we are currently working on with master teachers from around the State. These teachers are developing unit plans for science for each grade level from Kindergarten through grade 8 and for Biology, Earth/Environmental Science, Chemistry, Physical Science and Physics at the high school level. Many of the units are in the review and field testing phase this spring. We plan to release them this summer.

We are also very excited about the new Graduation Project requirement in North Carolina. We see this as an opportunity for student research in the sciences. We are encouraging science teachers and the science community to support students interested in various science topics and scientific research. The Office of Environmental Education has created an excellent website to support students interested in the environmental sciences. Please visit it at:

<http://www.eenorthcarolina.org/gradproject.html>

Normally the NC Standard Course of Study for Science is revised every five years. Our current standards were adopted in 2004 so the next revision is due in 2009. However, the State Board of Education has asked for a delay in revisions pending their analysis of various recommendations from the Blue Ribbon Commission on Testing and Accountability. This report can be read at:

http://www.ncpublicschools.org/sbe_meetings/0801/accountabilityfinalreport.pdf

Puerto Rico (no information submitted)

South Carolina (submitted by Gwen Marie Daley)

The big news in the Carolinas is the upcoming meeting of the Southeastern Section of the Geologic Society of America in Charlotte from April 10th -11th. Of particular interest is the "Teaching Evolution using State Standards" day-long event co-sponsored by GSA and NAGT on April 12th. For more information on this as well as field trips and other information about the meeting, please visit the meeting website (<http://www.geosociety.org/sectdiv/southe/08mtg>).

Clemson University is again offering a three-credit hour summer field course (GEOL 790) through their SC MAPS program called "Discover Carolina: Mountains to the Sea" which will meet July 14th-25th. For more information on this and other SC MAPs offerings, please see:

<http://www.ces.clemson.edu/scmaps/courses.html>.

The Carolina Coastal Discovery Marine Education Program (a division of the South Carolina DNR) is offering a free four-day workshop (June 11th-14th) for 6th through 12th grade teachers in Berkeley, Dorchester, Georgetown and Horry counties to the ACE (Ashepoo, Combahee and Edisto rivers) Basin. Meals and lodging costs will be picked up by the Gaylord and Dorothy Donnelley Foundation Grant. For more information and an application form, please see:

<http://www.dnr.sc.gov/marine/discovery/aceadvent.html>).

Those interested in South Carolina seismicity are encouraged to visit the Lithospheric Seismology (<http://www.seis.sc.edu/>) and South Carolina Seismic Network (<http://scsn.seis.sc.edu/>).

Tennessee (submitted by Michael A. Gibson)

2007 Tennessee Science Teachers Association Meeting

Nashville hosted the 2007 NSTA Area meeting December. The Paleontological Society and the Tennessee Earth Science Teachers co-sponsored a day-long workshop entitled: **Evolution: Teaching Change Over Time Using the Standards.**

The workshop was organized by Dr. Michael A. Gibson and Dr. Lionel Crews (University of Tennessee at Martin) and Dr. Ann Holmes (University of Tennessee at Chattanooga). Over fifty teachers participated in the workshop receiving instruction and activities that focused on cosmic, geologic, and organic evolution. Several additional breakout sessions were provided the following day for more focused topics and for teacher input and questions. A similar format workshop is planned for the 2008 SE GSA meeting in Charlotte, NC.



OEST Award Presentation

The winner of the 2007 Outstanding Earth Science Teacher award [*both Tennessee and SENAGT awards – see previous issue – ed.*], Mrs. Patricia Royle from Camden Junior High School, was presented her award at the 2007 Tennessee Science Teacher Association annual meeting.

New Science Graduation Requirements for High School

The State of Tennessee approved a revamping of its science graduation requirements for graduation. Students on a “scholastic” tract will be required to complete one year of biology, chemistry, along with two additional sciences to graduate from high school. The new requirements are targeted to take effect 2008-09 academic year. The new standards are available online:

<http://www.state.tn.us/education/ci/curriculum.shtml>.

Master of Education: Geoscience Education degree begins Fall, 2008

The University of Tennessee at Martin will begin offering on-line courses leading toward a Master of Education; Interdisciplinary - Geoscience Education Concentration. The first courses, Earth Systems Science and Physical Geology, will be offered Fall of 2008. The degree consists of a combination of School of Education courses and 18 hours of graduate-level content courses in Earth material geology, planetary science, ocean science, climatology, and evolution, with a three-hour field experience requirement as well. Anyone interested should contact Dr. Michael Gibson, Dept. of Geology, Geography, & Physics, University of Tennessee at Martin, Martin, TN 38238 (731.881.7435; mjibson@utm.edu).



OUTSTANDING EARTH SCIENCE TEACHER AWARD Nomination / Application Form

Name _____ Years Teaching _____
Street Address _____ Telephone _____
City, State & Zip _____ e-mail _____
College/University attended _____ Degree(s) _____ Major _____
Annual percentage class time devoted to teaching earth science _____ Grade level(s) _____
Name of School _____ Telephone _____ Fax _____
School Address _____
Name and Address of School District Superintendent _____
Name and Address of Local Newspaper _____

Respond to the following, using *no more than one typewritten page* per item. Include supporting documentation in the form of letters, products, or publications as appropriate.

1. Teaching ability: What techniques does the nominee/applicant employ? What is his/her teaching philosophy? Are his/her courses challenging and comprehensive? Do students enjoy his/her classes?
2. Inventiveness: What new ideas, materials, software, instructional strategies, or techniques has the nominee/applicant developed?
3. Initiative: How does the nominee/applicant handle new situations and accommodate students of various abilities? Be specific.
4. Cooperativeness: How does the nominee/applicant cooperate in the total school program and in other academic areas?
5. Strengths: What are the principal strengths of the nominee/applicant?
6. Community involvement: How is the nominee/applicant involved in community and/or youth activities?
7. Other activities: List other professional activities and noteworthy accomplishments.

Name of Nominator _____ Telephone _____
Address _____ E-mail _____

Signature of Nominator (or Applicant) _____

Send all forms, materials, and supporting documentation in one package to:

Executive Director
National Association of Geoscience Teachers or The OEST Chair of your local
P.O. Box 5443
Bellingham, WA 98227-5443 NAGT Section

Please feel free to copy this form for nomination purposes.

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