2010 The Science of Climate Change

Two Great Events...on November 13, 2010

NMAS has partnered with the New Mexico Museum of Natural History and Science to offer NMAS members and Museum visitors a special climate change lecture in the afternoon at the Museum

Dr. Wilbert Weijer
Los Alamos National Lab
“The Science of Climate Change: The Role of the Oceans in the Climate System”

2 p.m. on November 13, 2010
@ the New Mexico Museum of Natural History and Science
See more on Dr. Weijer on page 6

The lecture is intended for the general public, followed by Q&A and discussion. NMAS members receive free admission to the Museum and the lecture for up to 4 people. Please bring the coupon with you on the afternoon of November 13.

THEN...please join us during the evening of November 13 for the...

NMAS 2010 Annual Banquet,
Outstanding Science Teacher Awards
and Distinguished Lecture

Dr. David S. Gutzler,
Earth and Planetary Science Department
University of New Mexico:
“Climate Change in the Historical Record”
See more on Dr. Gutzler on page 6

Dinner will begin at 6pm with the NM Outstanding Science Teacher awards and lecture following.

The evening will be held at the New Mexico Museum of Natural History and Science, 1801 Mountain Rd. NW, Albuquerque, NM.
See page 8 for the banquet registration.

Please Pay 2010 Membership Dues!
The last year you paid dues is on your mailing label. If you have not yet paid dues for 2010, please fill out the form on page 7 and send your dues to NMAS.
We thank Glenn Kuswa for his service as NMAS Treasurer. He has had to temporarily relocate to another state. Thank you to David Duggan, a past-Treasurer of NMAS for taking on these duties as acting Treasurer.

Members - note that NMAS has reinstated the popular Life Membership category. Check it out on page 7.

NMAS MEMBER NEWS...

Thank you to these NMAS members who have made donations this year to NMAS or to the NMAS Endowment Fund.

Mercedes Agogino
Hal Bell
Stirling Colgate
David Duggan
--through United Way giving
Malva Knoll
Glenn Kuswa
Walter Lwowski
Richard Nygren
---through United Way giving
Harry and Mona Pomeroy
Donivan Porterfiend
Vincente Romero
David Steinhaus
Sidney Stone
Phil and Aija Thatcher
Angela Wandinger-Ness
President’s Message - October 2010
Laura Crossey

As we head into the fall season in New Mexico, it is with some urgency that I request all members to consider the goals of our society. As a state academy of science, the New Mexico Academy of Science joins NAAS and literally hundreds of affiliated societies and other state academies of science in promoting science and monitoring issues which affect the scientific community. As many issues and needs clamor for our attention, it is often difficult to find the time necessary to maintain the activities we have traditionally supported, much less expand our efforts. Yet every time we meet with teachers, judge a science fair project, encourage a junior colleague, or participate in one of the many events sponsored and supported by NMAS, we see the reward of that time commitment.

Our core membership remains dedicated, but we must grow and engage a broader segment of the scientific community in New Mexico. Our voice is needed now more than ever. I hope that all members will participate in a revitalization of the NMAS through contributing creative ideas and encouraging new members through personal networks.

I want to extend a global ‘Thank You!’ to the NMAS Board and all NMAS members who participated in events this past year. Please participate in our upcoming events this November (see announcements in this newsletter). Continue your contributions, and join me in extending invitations to new members of our community as well as others who may not be aware of our activities.

Bring new ideas and suggestions to the November banquet, come celebrate the awards to some of New Mexico’s most outstanding teachers, and plan to attend the talks by Dr. Wilbert Weijer in the afternoon and Dr. David Gutzler in the evening. I look forward to seeing you there.
2010 State NMJAS Paper Competition Winners
By Lynn Brandvold, NMJAS Coordinator

Cash awards for NMJAS winners were provided by a grant from Sandia-Lockheed Martin.

Senior Division

First Place
Laura Lane
Formulating Trends of Nematode Distribution
Aztec High School
Aztec, NM

Second Place
Paulina Majewska
Wetting of Materials Surface
Los Alamos High School
Los Alamos, NM

Third Place
Hellen Chiou
The Effect of Sunlight on Preservation of Vitamin B2
Carlsbad High School
Carlsbad, NM

Honorable Mention
Natasha Hite
Bioremediation off Landfill Leachate Water Using Populars and Cattails in Wetlands
Grants High School
Grants, NM

Junior Division

First Place
Jeongmin Lee
Rotation of Light
Sierra Middle School
Las Cruces, NM

Second Place
Daniel Ahrens
Does a Change in Light Cycle Bug Insects?
Los Alamos Middle School
Los Alamos, NM

Third Place
Ryan Howard
Water Rockets
St. Mary’s Middle School
Albuquerque, NM

Honorable Mention
Vladislav Sevostianov
The Electrical Conductivity of Bones
Sierra Middle School
Las Cruces, NM

Formulating Trends of Nematode Disturbutions Based on the Modified Baermann Funnel Extractions and Using the Four Corners Nematode from Soil Samples collected in San Juan County of New Mexico: Providing a guide for enviromental management during site restoration project.
Laura B. Lane, Aztec High School, Aztec, NM

There are over 20,000 gas wells in the Four Corners Area of New Mexico. When a gas well comes to end-of-life, energy companies must reclaim the abandoned well sites and accessroads. Reclamation involves re-contouring, restoring topsoil, and reestablishing native vegetation. Reestablishing plant biodiversity quickly is desired and minimizes soil erosion, protects surface water and provides forage for animals. It typically takes two to five years to re-vegetate a site if the soil conditions are favorable. Nematodes have been shown to be an effective indicator of soil ecosystem health. The purpose of this third-year project is to identify the desired nematode distributions that would indicate a healthy soil ecosystem and successful reclamation. Sixty samples were collected from three geographic areas in San Juan County, NM. Status of site disturbance, soil conditions, and plant community were analyzed. A modified Baermann-Funnel extraction method and the Four Corner Nematode Key (Lane, 2008) was used to screen each sample. The data indicates that nematode distributions associated with particular plant communities are dependent on geographic areas. The trends can be used as an effective indicator of soil ecosystem health. A Four Corners guide for reclamation management is in-development. More samples next year will help complete the guide.

Winners - Rio Grande Chapter
AVS Science & Technology Society

The AVS Science & Technology Society, formerly the New Mexico Chapter of the American Vacuum Society, sends judges and selects its own winners in the paper competition and awards prizes to these winners as well as to their teachers/sponsors. The New Mexico Academy of Science is very grateful for their support.

Senior Division
First Place
Laura B. Lane
Aztec High School
Sponsor: Michael Lane

Second Place
Natasha Hite
Grants High School
Sponsor: Shelby Alexander

Junior Division
First Place
St. Mary’s Middle School
Sponsor: Carol Johansen

Second Place
Jeongmin Lee
Sierra Middle School
Sponsor: Melly Locke
The Trail of Time at the Grand Canyon

There is a new approach to geoscience education in the National Park System... the “Trail of Time” at the Grand Canyon...“grand” opening of the trail is in October 2010, during the annual Earth Science Week (ESW is sponsored nationally by the American Geological Institute).

The Trail of Time is the world’s largest geoscience exhibition at the world’s grandest geologic landscape. It is a fully accessible interpretive walking timeline trail located along the canyon rim. It utilizes the unique vistas and rocks at Grand Canyon to help visitors ponder, explore and understand the magnitude of geologic time and the stories encoded in the rocks and views of the canyon. The 4.56 km long trail is marked every meter, each meter = 1 million years of our 4,560,000,000 year-long Earth history. Viewing tubes and interpretive materials help visitors connect the rocks visible in the Canyon to their place on the geologic timeline.

The Trail of Time is designed to engage visitors with culturally responsive and inclusive content, and is also part of a reserach program in science education aimed at understanding and helping to improve public cognition of geologic time.

Geologists Karl Karlstrom and Laura Crossey (Current NMAS President), both from UNM, and. Steve Semken from ASU were the Principal Investigators for this project. Mike Williams (UNM alum and currently at UMass) and UNM PhD candidate Ryan Crow were members of the design and implementation team. This innovative exhibit was funded by the National Science Foundation in partnership with National Park Service.

For information, go to these links-
http://www.nsf.gov/news/now_showing/more/trailoftime.jsp

Visit Grand Canyon National Park and Walk the Trail of Time!

DID YOU KNOW?

La Niña weather patterns, when the surface sea temperatures in the equatorial Pacific are cool, typically mean less snow and higher winter temperatures in New Mexico - and that usually means drought conditions in our state. The current La Niña pattern in the equatorial Pacific could be the strongest one seen since the mid-1950s.

Climate Change in New Mexico

by Tish Morris (NMAS Member)
Education Division
New Mexico Museum of Natural History and Science
(Adapted from the Museum Educational Flyer “Climate Change in New Mexico”)

Effects in the Rio Grande Bosque.

One of the effects of climate change that can be seen in New Mexico is in the Rio Grande cottonwood along the Rio Grande bosque. Cottonwoods flower and then open their seed pods when the river is high from snow melt in the spring. Seeds landing on wet, sandy, bare soil may germinate and sprout. In general, due to warmer temperatures, plants are waking-up and putting out leaves and flowers earlier in the season. If New Mexico has lower snow pack, resulting in less water flow in the river, there are fewer places where the cottonwood seeds have all the right conditions to germinate. Contrary to the cycle of the Rio Grande cottonwood, the exotic tree saltcedar can flower and put out seeds throughout the summer. The bosque could shift from one dominated by our native keystone species, Rio Grande cottonwood, to one dominated by an exotic species like saltcedar.

Some Questions Ecologists and Biologists are Interested in Answering Concerning the Effects of Climate Change in New Mexico

--Are plants flowering when pollinators are out? If spring green-up is moving earlier in the year, are other parts of the environment changing at the same pace?
--Are numbers of any species being reduced because conditions are no longer right for survival, leading to more threatened and endangered species?
--Are animals and plants moving and surviving in new areas where the conditions are better for their survival? Sometimes this means moving north, sometimes moving up-slope to cooler, wetter conditions.
--Has the fire danger increased? Are non-native species such as exotic grasses moving into an area, increasing the fire danger?
--Are plants dying as conditions change? Southwest forests have had huge piñon and ponderosa pine die-offs with the recent drought.
--Are communities of plants and animals changing--reorganized from previous stability?
--Are new diseases able to get a foothold with these changing conditions?
Recent Awardees for Science/Math Teaching Excellence
by Laura J. Crossey, NMAS President
and Professor, Dept Earth & Planetary Sci
University of New Mexico

Over the summer, President Obama selected 103 teachers to receive the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST). This is the nation’s highest honor for science and mathematics teaching, and we were delighted to learn that two New Mexico teachers (and UNM alumni) were among the recipients.

Dana Dawson (BS, Computer Science) has been educating students for 18 years. She has worked in the Moriarty-Edgewood School District for the last 14 years and serves as the district’s Mathematics Intervention Specialist for grades six through eight.

Vince Case (M.A. in Language, Literacy, and Sociocultural Studies) has taught for 15 years, the past 10 at School on Wheels Alternative High School in Albuquerque. At School on Wheels, Vince implemented an experiential curriculum that integrates literacy, citizenship and inquiry-based science. Because of his work at School on Wheels, Vince Case was named one of the NMAS Outstanding Science Teachers for 2009. This year, he began work at the Sandia Mountain Natural History Center, the environmental education facility for the New Mexico Museum of Natural History and Science.

We’re so proud of them both and the credit they bring New Mexico!

DID YOU KNOW?
There is a difference between weather and climate. Weather is what we experience daily, while climate looks at conditions over a longer period of time. For example, climate looks at temperatures and precipitation over decades. Rainfall will vary across the state with some areas getting more rain/snow from particular storms than other areas, so, taking the long view is necessary, not just looking at one season’s record to look for evidence of climate change.

Two Great Speakers...on November 13, 2010

DR. WILBERT WEIJER WILL SPEAK AT 2 P.M.
He received his PhD in 2000 from the University of Utrecht, in the Netherlands. He was a postdoctoral fellow at the Institute for Marine and Atmospheric Research in Utrecht, the Netherlands, and at Scripps Institution of Oceanography in La Jolla, California. In 2006 he moved to Los Alamos to take a position in the Climate, Ocean, and Sea-Ice Modeling (COSIM) group at Los Alamos National Laboratory. Since 2009 he is also associated with the New Mexico Consortium, a non-profit organization formed by the three New Mexico universities.

His research focuses on the global ocean circulation and its role in the climate system. Of special interest is to what extent the ocean circulation affects the climate system. Specific topics include the meridional overturning circulation, the variability of the climate system in the Pacific over decades, and a process called Agulhas Leakage, an exchange of water between the Indian and Atlantic Oceans.

DR. DAVID S. GUTZLER WILL SPEAK AFTER DINNER
He is Professor of Meteorology and Climatology in the Department of Earth & Planetary Sciences at UNM. He teaches courses on basic principles of weather and climate, and general statistical analysis. He earned degrees from the University of California at Berkeley (B.S., Engineering Physics) and MIT (PhD, Meteorology). He held research positions in private industry and the Federal government before joining the UNM faculty in 1995. His research is based on analysis of climatic observations and model output, with the goal of improving the skill and usefulness of climate predictions on seasonal and longer time scales.

Since coming to UNM he and his students have focused on understanding the mechanisms that could lead to improved prediction of summer precipitation and long-term drought in the Southwest. In 2008 he received an award for outstanding teaching from the UNM College of Arts & Sciences. Earlier this year a nomination by the U.S. Global Change Research Program led to his appointment as a lead author for the next science assessment report of the U.N. Intergovernmental Panel on Climate Change, due out in 2013.
Membership Form
New Mexico Academy of Science

New Membership [ ] Renewal 2010 [ ] Renewal 09 [ ] Renewal 2011 [ ] Publications [ ] Donation [ ]

Date _________________ Name _______________________________________________________

Employer/Firm/Affiliation __________________________ Title ____________________________

Primary Interest (geology, biology, chemistry, physics, science education, etc.)_____________________

Mailing Address: _________________________________________________________________
______________________________________________________________________________

Phone _________________ FAX _________________ email ____________________________

Check if your address is different from that on the mailing label of this newsletter [ ]

Membership Class (check one)

[ ] Member $25/year
[ ] Student $15/year
[ ] Life Member $400 (3/4 of this amount goes to the NMAS Endowment)
[ ] Subscription $30/year (Libraries only)
[ ] Contribution to the NMAS Endowment $_______

Membership Subtotal: $_______
Donation Subtotal: $_______
Publication subtotal: $_______

Total: $_______

Membership includes newsletters, and occasional special Journal of Science volumes (sent to life members and members who have paid their annual dues during the volume’s year of publication).

Send check payable to NMAS, to:
New Mexico Academy of Science
1801 Mountain Rd. NW
Albuquerque, NM 87104
And make a donation to the NMAS Endowment
Registration Form

NMAS 2010 Annual Banquet, Awards, and Lecture
6pm, November 13, 2010
Registration for NMAS banquet/lecture evening event:
$35.00 (includes banquet and lecture)

NOTE: this registration is for the evening event only on November 13...the afternoon lecture is free of charge if you are an NMAS member (bring the coupon on the left side of the page to the Admissions Desk for the afternoon event...and...see page 1 for more information

Name: ________________________________________
Mailing Address: ____________________________________________
Email address or phone number: ________________________________
Registration for banquet/lecture for _____persons = $_______ (@$35.00 each)
Total Amount Enclosed = $________

Please mail (or email or phone) your registration (for the banquet/lecture event) by November 10 to:
New Mexico Academy of Science
P.O. Box 13071
Albuquerque, NM 87192-3071
ATTN: David Duggan
To register for the banquet/lecture evening event by email (and pay with a check made out to NMAS when you arrive) contact duggan@acm.org

Don't Delay....Registration must be received by November 10th.