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## 2010 The Science of Climate Change

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**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 ...see pg 8 for coupon....please bring the coupon with you on the afternoon of November 13.

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**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.*

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**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.



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## NMAAS MEMBER NEWS...

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

Mercedes Agogino

Hal Bell

Stirling Colgate

David Duggan

--through United Way giving

Malva Knoll

Glenn Kuswa

Walter Lwowski

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---through United Way giving

Harry and Mona Pomeroy

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Phil and Aija Thatcher

Angela Wandinger-Ness

NMAAS Newsletter  
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## NEW MEXICO ACADEMY OF SCIENCE

Founded in 1902 to foster scientific research and scientific cooperation, increase public awareness of the role of science in human progress and human welfare, and promote science education in New Mexico.

The Academy has been in continuous existence since 1915, and became formally associated with the New Mexico Museum of Natural History and Science in 1995.

*Affiliated with the American Association for the Advancement of Science (AAAS)*

*Member of the National Association of the Academies of Science (NAAS)*

We thank Glenn Kuswa for his service as NMAAS Treasurer. He has had to temporarily relocate to another state. Thank you to David Duggan, a past-Treasurer of NMAAS for taking on these duties as acting Treasurer.

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

**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 NMAAS, 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 NMAAS through contributing creative ideas and encouraging new members through personal networks.

I want to extend a global "Thank You!" to the NMAAS Board and all NMAAS 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 research program in science education aimed at understanding and helping to improve public cognition of geologic time.

Geologists Karl Karlstrom and Laura Crossey (Current NMAAS 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.nps.gov/grca/parknews/grand-canyon-national-park-to-dedicate-the-trail-of-time.htm>

[http://www.nsf.gov/news/now\\_showing/more/trailoftime.jsp](http://www.nsf.gov/news/now_showing/more/trailoftime.jsp)

<http://www.grandcanyonnews.com/main.asp?SectionID=229&SubSectionID=732&ArticleID=8764>

<http://earthly-musings.blogspot.com/2010/10/trail-of-time-dedicated-at-grand-canyon.html>

### 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 (NMAAS 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

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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)
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Membership Subtotal: \$ \_\_\_\_\_  
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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

### NMAS PUBLICATIONS

<b>New Mexico Journal of Science</b> Set of all available pre-1992 back issues	\$10 _____
<b>From Sundaggers to Space Exploration</b> (NMAS/Sigma Xi, 1986)	\$4 _____
<b>Dinosaurs of New Mexico</b> (NMAS Journal v. 32, 1992)	\$10 _____
<b>The Importance of Agricultural Science in New Mexico's Economy</b> (NMAS Journal v. 34, 1994)	\$10 _____
<b>Astronomy in New Mexico: Past, Present and Future</b> (NMAS Journal v. 35, 1995)	\$10 _____
<b>New Mexico's Natural Heritage: Biological Diversity in the Land of Enchantment</b> (NMAS Journal v. 36, 1996)	\$10 _____
<b>Environmental Management: Current and Future Needs</b> (NMAS Journal v. 37, 1997)	\$10 _____
<b>Water Resource Issues in New Mexico</b> (NMAS Journal v. 38, 1998)	\$10 _____
<b>Ensuring Sustainable Development of Arid Lands Through Time</b> (NMAS Journal v. 39, 1999)	\$10 _____
<b>NMAS Journal v. 40, 2000</b>	\$10 _____
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<b>NMAS Journal v. 42, 2002 (Centennial CD)</b>	\$10 _____
<b>NMAS Journal v. 43, 2003</b>	\$10 _____
<b>Science on the Border</b> (NMAS Journal v. 44, 2006)	<b>\$10 _____</b>
<b>NEW..Energy in the Southwest</b> <small>Online at <a href="http://www.nmas.org/NMJoS-Volume-45.pdf">www.nmas.org/NMJoS-Volume-45.pdf</a></small> (NMAS Journal v. 45, 2008)	\$10 _____
Subtotal:	\$ _____
+ Handling:	\$ 2.00

NMAS Newsletter  
Volume 96 no. 2&3,  
Fall, 2010

**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.**

**coupon**

New Mexico Academy of Science  
and  
NM Museum of Natural  
History & Science

**Afternoon Lecture @ the Museum  
Climate Change and the Oceans**

**This coupon is good for up to 4  
Museum admissions  
(adult, senior or children)**

**Good only for Museum admissions  
(and entry to lecture)  
on November 13, 2010**

**Please present this coupon at  
the admissions desk.**



**NEW MEXICO  
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**Newsletter**

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