



The Pennsylvania Academy of Science



Newsletter – Winter 2011

News from the cave... (office of PAS President Mike Campbell)

It is a pleasure for me to help lead the PAS for the next few years, as we have an excellent group of board and committee members that are working hard to maintain and improve the academy's programs to serve our members. We hope to see all of you at our annual meeting in Altoona on April 1-3 (no fooling!), and have a number of new and exciting activities to offer. Check-out the preliminary schedule and make your hotel reservations now! We'll be meeting jointly with the PA Chapter of the Wildlife Society on the campus of Penn State Altoona. There will be a field trip and mixer on Friday, a dynamite speaker on Saturday before the banquet, and a special workshop for pre-college teachers on Sunday morning. Thanks much to PSU-Altoona's Ed Levri and President-Elect Robert Coxe for setting this up, and to Mike Elnitsky, who put together this publication as our new newsletter editor. And start planning ahead for our 2012 meeting - to be held on the campus of Cedar Crest College in Allentown!



Nominations for PAS Board Positions

At the Fall Meeting of the PAS Board held on October 2, 2010, the following slate of nominees for elected board positions were identified:

Journal and Books Editor: Jane Huffman (East Stroudsburg University)

Directors at Large: Theo Light (Shippensburg State University), Ed Levri (Penn State Altoona), Jane Cavender (Elizabethtown College), and Fred Brenner (Grove City College).

A call for additional nominations will be made at the Annual Business Meeting in Altoona on April 2, prior to a vote. Please contact Dr. Debbie Ricker (Immediate Past President and Chair of Nominating Committee) if you have any questions or concerns about the nomination and election process.

**The Pennsylvania Academy of Science Annual Meeting: April 1-3, 2011
Penn State Altoona**

**Guide to the 2011 Annual Meeting of the Pennsylvania Academy
of Science**

The 2011 Annual meeting of the Pennsylvania Academy of Science will be held on the campus of Penn State-Altoona (PSU-Altoona) in Altoona, Pa. Unlike other years, where all events were held at the same hotel, this year events will happen in different places. All events on Saturday and Sunday will be held on the PSU-Altoona campus in Hawthorn Hall, Dining Hall (Saturday lunch), and the Gymnasium (Saturday Banquet)—please see the map below. Friday, however, we will host a field trip that will leave from the hotels (Marriott and Ramada), and a reception at the Railroaders Memorial Museum in downtown Altoona. All meals except for Saturday lunch and dinner, and Sunday Breakfast for Science Education Workshop participants, will be on your own.

2011 Annual Meeting at a glance-

Friday April 1

- 1:00-4:00 pm Field trip to Gamesa (wind turbine facility) and wind farm
- 7:00-9:00 pm Reception at Railroaders Memorial Museum in Altoona

Saturday April 2

- 8:30-11:30 Concurrent Oral and Poster Sessions
Symposium on Climate Change Science/Renewable Energy in PA
- 4:00 PM Plenary session address by Michael E. Mann (followed by meet & greet)
- 6:00 PM Banquet and student awards for outstanding talks & posters

Sunday April 3

- 8:30-11:30 Concurrent Oral and Poster Sessions
Teachers Workshop on Climate Change Science/Renewable Energy

Lodging

A block of rooms has been reserved (\$89.99/night for up to four people in a room) at both the Ramada and Courtyard Marriott in Altoona. Unfortunately, both of the hotels are located a distance from campus (see directions from both to campus below). The Ramada is slightly closer to the campus than the Courtyard Marriott and has some restaurants located around it and in it. The room block and the rate at both will last until March 1, 2011 so be sure to reserve your room early. Tell the person at the hotel that you are attending the Pennsylvania Academy of Science to get the rate.

Ramada Altoona: 1 Sheraton Drive, Altoona, PA 16601 814-946-1631

Courtyard Marriott, Altoona: 2 Convention Center Drive, Altoona, PA 814-312-1800

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Friday Afternoon (April 1) field trip (1:00 pm to 4:00 pm)

Registration for the field trip is first come, first served for the first 34 people to register. The bus for the field trip will leave from the Marriott at 1:00 pm, the Ramada at 1:10 pm, and will arrive back on campus at 4:00 pm. The field trip will be to the Gamesa Wind Turbine Plant in Ebensburg, Pennsylvania and to a nearby wind farm.

Friday Night (April 1) Reception (7:00 pm to 9:00 pm)

A reception will be held on Friday night from 7:00 pm to 9:00 pm at the Railroaders Memorial Museum in downtown Altoona. This is a link for information about the museum-

http://www.railroadcity.com/altoona_rail_roaders_memorial_museum/index.php

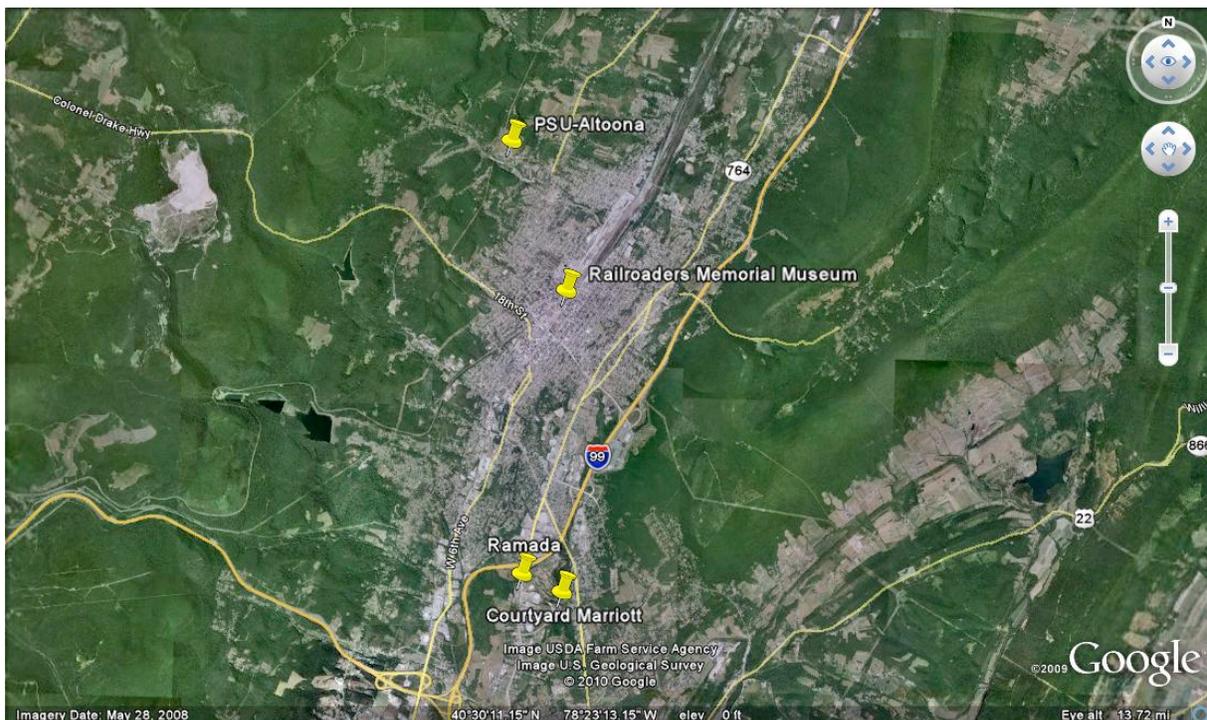
This is historical museum on the railroad heritage of Altoona, Pennsylvania has been featured on the Syfy channel's Ghost Hunters program for its paranormal activity. Refreshments will be served at the reception. The address for the Railroaders Memorial Museum is:

1300 Ninth Avenue, Altoona, PA 16602

814-946-0834

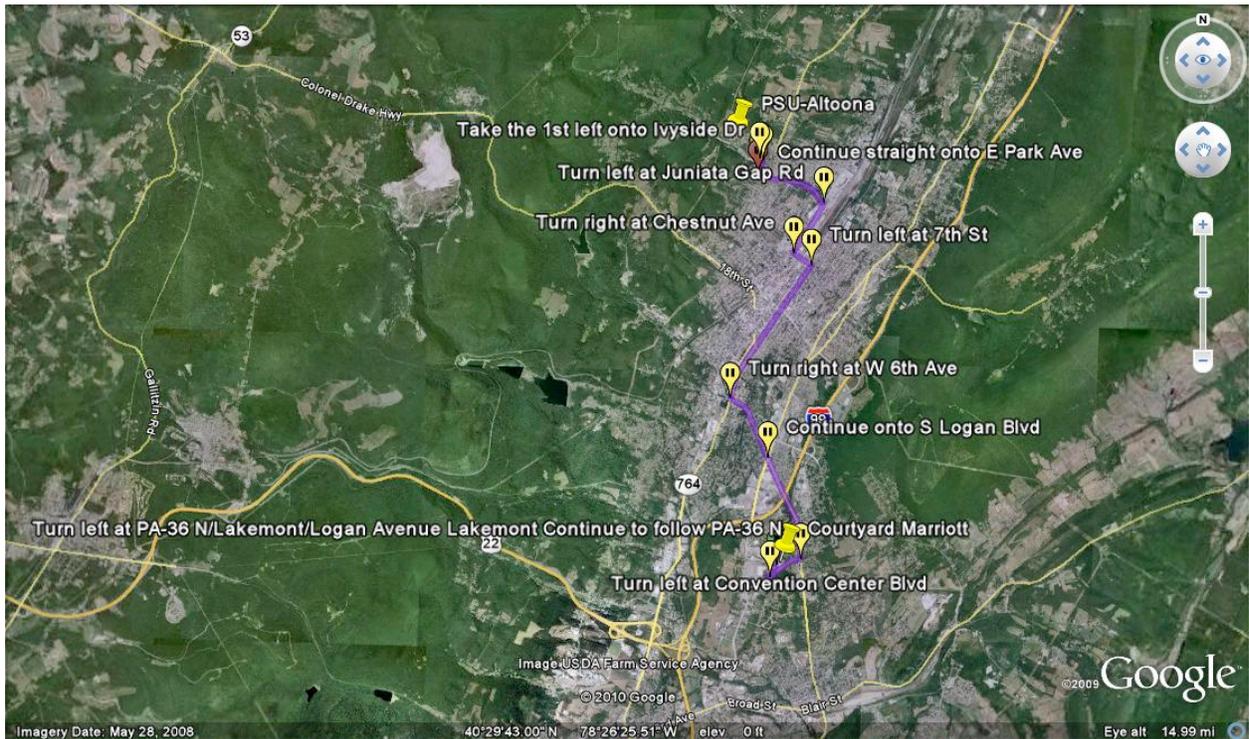
Sunday (April 3) Science Education Workshop

We are adding a Science Education Workshop this year which will add a hands on activity for Secondary Science Educators. Two students of a teacher from Pittsburgh, Pa and a teacher from Altoona, Pa will be presenting on alternative energy. Everybody is welcome to attend, but most content will be geared towards secondary science educators.

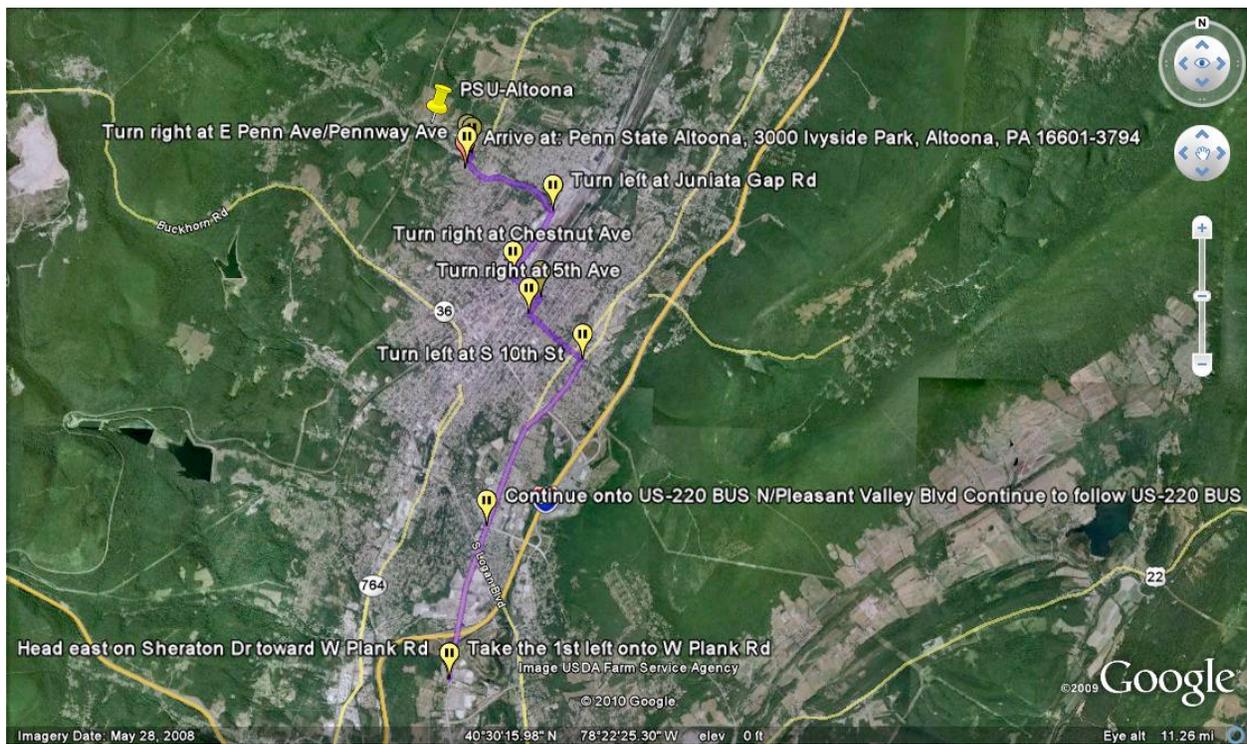


Map of Altoona showing event locations

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Directions to PSU-Altoona from the Courtyard Marriott



Directions to PSU-Altoona from the Ramada

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Saturday and Sunday on Campus (see map below)

All of the Concurrent Sessions will be held in the Hawthorn Building on campus. Saturday lunch will be held in the Port Sky Café (Dining Hall) and the Saturday Banquet and mixer will be held in the Steven A. Adler Athletic Complex. You should park in the parking lot next to Hawthorn Hall (Parking Lot F).



BUILDINGS

- | | |
|---|--|
| 1. Science Building | 17. Oak Residence Hall |
| 2. J.E. Holtzinger Building | 18. Maple Residence Hall |
| 3. Ralph and Helen Force Advanced Technology Center | 19. Spruce Residence Hall |
| 4. Pine Building | 20. Cedar Residence Hall |
| 5. Elm Building | 21. Environmental Resources Lab (ERL) Building |
| 6. Misciagna Family Center for Performing Arts | 22. Rider Building |
| 7. E. Raymond Smith Building | 23. Facilities and Operations Building |
| 8. Robert E. Eiche Library | 24. Linden Building |
| 9. Learning Resources Center | 25. Cypress Center |
| 10. Hawthorn Building | 26. Sheetz Family Health Center |
| 11. Edith Davis Eve Chapel | 27. Hemlock Building |
| 12. Steven A. Adler Athletic Complex | 28. Willow Building (University Police) |
| 13. Jack Baker Barbecue Pavilion | 29. Maintenance Storage |
| 14. Harry E. Slep Student Center | 30. Larch House |
| 15. Port Sky Cafe | 31. Beech House |
| 16. The Penn State Bookstore | |

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PJAS Teacher Education Workshop to Debut at PAS 2011 Annual Meeting

"Winds of Change," a PJAS Teacher Education Workshop, will meet on Sun., 3 April 2011, from 8:30 to 11:30 am, at the PAS Annual Meeting at Penn State-Altoona. The workshop represents an exciting, new partnership between PAS and PJAS. Teachers have the opportunity to meet and share innovative PJAS lesson plans and projects, and also attend PAS sessions.

Renewable energy is the focus area for the 2011 workshop. This hot topic is part of a pilot program that provides students with the tools for solving the related issues of global climate change.

Speakers for this year are PJAS members, Sue Morgan and Alice Flarend. Sue will present an activity on calculating our carbon footprint, and also talk about renewable energy projects. Two of Sue's eighth grade students will demonstrate their projects--a wind turbine, and a model that shows heat conduction using solar energy. Alice, a high school physics specialist, will do a hands-on presentation on U.S. energy needs. Bring your lap-top to the workshop, if you have one, since it will allow you to benefit more fully from Alice's presentation.

All registered persons, including PAS members, are welcome to attend the workshop. The registration fee for Sunday-only is twenty dollars. A continental breakfast will be served. Please contact Vivian Coxe, PAS Liaison for the workshop, at vivian.coxe@comcast.net for information about Act 48 credit. This credit will be available for those teachers who meet the criteria.

Come aboard, and set sail for a challenging, green science adventure!



**The Pennsylvania Academy of Science Annual Meeting: April 1-3, 2011
Penn State Altoona**



Global Climate Scientist

Michael E. Mann

Plenary Session Speaker

Dr. Michael E. Mann will deliver a talk entitled "Dire Predictions: Understanding Global Warming" on Saturday April 2 at the joint meeting of the PA Academy of Science and the PA Chapter of The Wildlife Society at Penn State Altoona.

Dr. Mann is a member of the Penn State University faculty, holding joint positions in the Departments of Meteorology and Geosciences, and the Earth and Environmental Systems Institute (ESSI). He is also director of the Penn State Earth System Science Center (ESSC).

He received his undergraduate degrees in Physics and Applied Math from the University of California at Berkeley, an M.S. degree in Physics from Yale University, and a Ph.D. in Geology & Geophysics from Yale University. Current areas of research include model/data comparisons aimed at understanding the long-term behavior of the climate.

Dr. Mann was a Lead Author on the "Observed Climate Variability and Change" chapter of the Intergovernmental Panel on Climate Change (IPCC) Third Scientific Assessment Report and in 2007 shared the Nobel Peace Prize with other IPCC authors. He has been organizing committee chair for the National Academy of Sciences 'Frontiers of Science'. He has received the outstanding publication award from NOAA, and in 2002 was selected as one of the 50 leading visionaries in science and technology by *Scientific American*. Dr. Mann is author of more than 130 peer-reviewed and edited publications, and recently co-authored the book "*Dire Predictions: Understanding Global Warming*" with colleague Lee Kump. He is also a co-founder and avid contributor to the award-winning science website "RealClimate.org".

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Pennsylvania Marcellus Shale at center stage of national energy development

If you have been paying attention to the news about Marcellus Shale and natural gas in Pennsylvania, then you already know that our state is a “keystone” in national energy development efforts. Citizens of Pennsylvania should take pride in their historical role in the U.S. energy economy. Northwest Pennsylvania was the birthplace of the oil industry in the United States, and much of the state has also been prodded open for extraction of our abundant coal resources. Now we are at the center of a natural gas boom.

Unfortunately, the exploitation of fossil fuels comes with a burden of environmental costs, and our state has an historic legacy of problems brought about by our energy extraction activities. As of 1995, the state had records of over 2400 miles of streams that failed to meet EPA-mandated standards of water quality attributed to past mining activities (Earle and Callaghan, 1998). We are frequently reminded that utilization of natural gas for energy is better for our atmosphere than burning coal, and helps decrease our national dependence on foreign oil.

We cannot ignore the fact that the hydraulic fracturing process used to extract this resource from deeply buried shale deposits utilizes a wide variety of hazardous chemicals (see EPA’s web site at <http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/index.cfm>), and potentially disastrous accidents happen, despite the best efforts of gas producers and regulatory agencies to try to do things right (e.g. Marcellus well blow-out in Clearfield County Moshannon State Forest on June 3, 2010).

The good news is that Pennsylvania scientists are getting involved in keeping tabs on environmental concerns with the natural gas boom, and Penn State University is now advancing a study to evaluate the effects of gas exploration disturbances on Pennsylvania’s forest ecosystems, with support of a 3-year grant from the Heinz Foundation. PSU’s Cooperative Extension Program is also actively developing outreach resources for our citizenry through their new Marcellus Center for Outreach & Research (<http://marcellus.psu.edu/>).

With its 2011 Annual Meeting program including a focus on climate change science and renewable energy, the Pennsylvania Academy of Science is now moving into the realm of state leadership in research and education regarding on energy-related issues. All PAS members whose work may tie into Marcellus shale environmental concerns should consider getting involved on the local level. Our statewide network of scientists and educators are uniquely positioned to have an impact, and as concerned citizens, we should take responsibility to help educate our communities about the issues and get our students involved!

Reference:

Earle, J. and T. Callaghan. 1998. Impacts of mine drainage on aquatic life, water uses, and man-made structures, in Brady, B.C., Kania, T., Smith, W.M., and Hornberger, R.J.(Eds. *Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania: Pennsylvania Department of Environmental Protection*, p. 4.1-4.10.

Feature on Climate Change Science:

Mapping the Horizontal Progress of Sea Level Rise using Vegetation Communities

Article and photo submitted by Robert Coxe, PAS President-Elect.

Vegetation Communities are the plant expressions of habitats on the ground. Each of the species contained within a community have a preference for particular habitat conditions and as such reflect changes in habitat characteristics. Because vegetation communities can be mapped by interpreting aerial imagery, they can be used to describe land use and habitat changes over time, including plotting the horizontal progress of sea level rise over the ground surface.

Sea level rise has been occurring since the glaciers of the last ice age began to melt about 12,000 years ago. However, rates of sea level rise have increased in recent years, outpacing historical rates. On-going research at Assawoman Wildlife Area in the Inland Bays region of southeastern Sussex County, Delaware reveals that a rapidly rising sea level is not entirely a concern of the future -- rates of sea level rise are increasing now (Glick et al 2008). The historical (70 year; 1937-2007) cumulative average rate of inundation over the entire wildlife area is approximately 1 acres/year, with water coverage increasing from 47 acres to 120 acres. The short term (5 year; 2002-2007) cumulative average rate of inundation is approximately 2-acres/year, revealing an increase in the average rate with water coverage going from about 111 acres to 120 acres¹. Aerial imagery from 1954, 1961, 1968, and 1997 was not studied at a quantitative level because of errors in geo-referencing. These imagery sets were used, though, to verify trends at a qualitative level. Some tracts within the wildlife area are being affected more than others, reflecting a general topographical difference in the tracts and overall exposure to tidal water.

The vegetation communities are changing as well. North Atlantic High Salt Marsh, composed of salt-meadow cordgrass (*Spartina patens*), which lies at a slightly higher elevation than the North Atlantic Low Salt Marsh, composed of salt marsh cordgrass (*Spartina alterniflora*), is among the communities possibly most affected. In 1937 there were 279 acres of North Atlantic High Salt Marsh present in the wildlife area, while in 2007 there were 92 acres. Grid ditching is evident in the Assawoman Wildlife Area marshes in 1937 and it is unknown whether the acreage of high marsh was artificially high due to salt hay farming or the effects of ditching drying the marsh. Some of the losses, though, can be attributed to the development of impoundments and invasion of common reed grass (*Phragmites australis*), but other losses are likely due to increased brackish water converting the high marsh to North Atlantic Low Salt Marsh



¹ Aerial imagery from 1954, 1961, 1968, and 1997 was not studied at a quantitative level because of errors in geo-referencing. These imagery sets were used, though, to verify trends at a qualitative level.

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or open water. Throughout the study period (1937-2007), North Atlantic High Salt Marsh has decreased at an average rate of about 2 acres/year. Recently (2002-2007) the average rate of loss has increased to 5 acres/year, in spite of no impoundments being developed in this time, following the trend of increasing water². North Atlantic Low Salt Marsh has also decreased overall from 1937 (694 acres) to 2007 (522 acres), largely from impoundment development and possibly sea level rise, but increased in the recent period (2002-2007) from 510 acres to 522 acres at the expense of the North Atlantic High Salt Marsh.

The woody vegetation communities located at the edge of the marshes are changed as well. Irregularly Flooded Eastern Tidal Salt Shrub, composed of salt shrub (*Baccharis halimifolia*) and marsh elder (*Iva frutescens*), has decreased overall since 1937 possibly reflecting the increased rate of rise. This community may be squeezed against the woodland edge and may not be able to retreat inland as sea level rises faster. Successional Maritime Forest and Loblolly Pine/Wax-Myrtle/Salt Meadow Cordgrass Woodland have both increased since 1937, going from 24 acres (1937) to 50 acres (2007) and 0 acres (1937) to 5 acres (2007), respectively. These communities are often the frontline forested communities adjacent to the marsh, and are intermediate between the marsh communities and more inland forests (e.g., Coastal Loblolly Pine Wetland Forest and Southern Red Oak/Heath Forest). This increase may be reflective of more brackish effects reaching the forested communities, which is converting them to communities that can handle these conditions.

Reference:

Glick, Patty, Jonathan Clough, and Brad Nunley. 2008. Sea-level Rise and Coastal Habitats in the Chesapeake Bay Region. National Wildlife Federation Technical Report. 121 p.

Robert will be sharing more about this work at the climate change symposium at our upcoming PAS Annual Meeting (April 1-3). The symposium will also include presentations from Sara Gris  and Theo Light, Greg Czarnecki, Mike Campbell, and Mike Elnitsky focusing on regional climate change impacts and management issues, including invasive species. Don't miss the meeting!

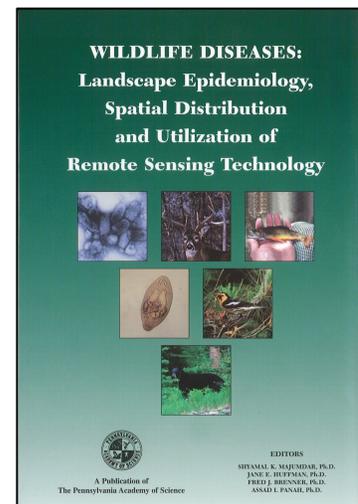
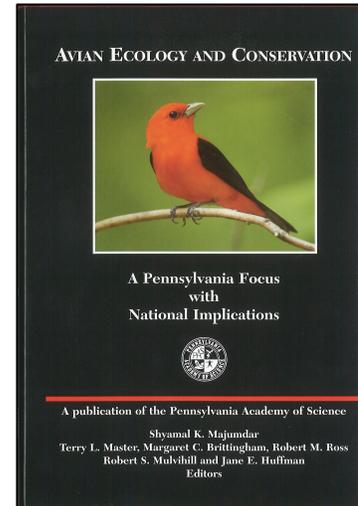
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PAS Books on the Move

Check out the latest PAS books now on sale through Amazon and the PAS web-site. Our latest book publication (2010) *Avian Ecology and Conservation: A Pennsylvania Focus with National Implications* (edited by Shyamal Majumdar, Terry Master, Margaret Brittingham, Robert Ross, Robert Mulvehill, and Jane Huffman) offers 27 chapters by dozens of ornithological experts from Pennsylvania and other states, with cutting edge insights on habitats of PA breeding birds, migration and wintering ecology, conservation issues and challenges, and emerging issues such as climate change, wind power development, contaminants, and emerging diseases. The other recent book to buy is *Wildlife Diseases: Landscape Epidemiology, Spatial Distribution and Utilization of Remote Sensing Technology*, published in 2005. It has been a great seller, but a few copies are still available.

Also, keep an eye out for our next new book to be available in May/June 2011 -- *Pandemic Influenza Viruses: Science, Surveillance and Public Health*, edited by Shyamal Majumdar (Lafayette College), Frederic Brenner (Grove City College), Jane Huffman (East Stroudsburg University), Robert G. McLean (National Wildlife Research Center), Assad I. Panah (University of Pittsburgh), Patricia J. Pietrobon (Sanofi Pasteur), Shamus P. Keeler (University of Georgia), and Steve Shive (East Stroudsburg University). This book will feature introductory chapters on the history and science of influenza diseases, plus contributions on surveillance and tracking technology, public health strategies and planning, and vaccines.

Finally, a unanimous vote at the Fall Meeting of the PAS Board approved advancement of next book project, tentatively entitled *Ecology and Conservation of Pennsylvania's Bats in a Time of Crisis*, with editors Howard P. Whidden (East Stroudsburg University), DeeAnn Reeder (Bucknell University), with Cal Butchkoski and Greg Turner (Pennsylvania Game Commission).



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PAS Grant and Prize Opportunities

Darbaker Prize - \$1000

The Darbaker Prize is a Pennsylvania Academy of Science (PAS) award given for outstanding scholarly contributions, which use microscopic techniques and present microscopic illustrations in the reporting of biological research. The award is competitive amongst qualified papers submitted in association with the Academy's annual meeting.

The Pennsylvania Academy of Science established the Darbaker Prize in 1952. Funds for the award are made available through a bequest of the late L.K. Darbaker, 1939 PAS President. Referring to the award, Dr. Darbaker stated: "Any sum applicable to the Pennsylvania Academy of Science shall be for grant or grants in Microscopical Biology."

To qualify for the Darbaker Prize, a scientist or scientists must: (1) have used microscopy (light, SEM, TEM or other technologies) in the research they report, (2) submit in proper format a manuscript reporting the results of the completed study for consideration to be published in the *Journal*, (3) specifically state a request to the Editor of the *Journal* to have their manuscript considered for the Darbaker Prize for the current calendar year, and (4) be a member of the Pennsylvania Academy of Science. Darbaker Prize competition manuscripts are expected to be presented and submitted at the PAS annual meeting, but if not, manuscripts will be accepted for consideration within four weeks (28 calendar days) following the last day of the annual meeting. Only manuscripts that have successfully completed the review process and have been accepted for publication in the *Journal* will be eligible for the award.

For further information contact:
Jane Huffman, PAS Past-President
jhuffman@po-box.esu.edu

PAS Research Grants

Make sure you check out the PAS web-site (under "funding opportunities") for announcements, instructions, and deadlines for our *college and high school student research grants*.

Contact Jane Cavender (Elizabethtown College) for details at cavender@etown.edu

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Pennsylvania Academy of Science Annual Fund Campaign

Fellow members of the Pennsylvania Academy of Science:

I would like to thank all of those who contributed to our first Annual Fund Campaign and to ask for your continued support. In order to adequately fund our undergraduate research program, we need to increase our Undergraduate Research Endowment. Currently we are funding the Journal by page charges and the operating fund of the Academy, but we would like to be able to create a sufficient endowment so that the interest can be used to support our excellent peer reviewed journal. The executive board of the Academy established the annual fund drive to increase our endowment for undergraduate research and to endow the Journal of the Pennsylvania Academy of Science. It is our desire to have the journal be self-sufficient and to be supported entirely through page charges and interest from our recently established Journal of the Pennsylvania Academy Endowment.

**Please apply my contribution of: _____ to the Undergraduate Research
Fund _____ to the Journal of the Pennsylvania Academy of Science Endowment
Signature _____**

Thank You. Fred J. Brenner, Past PAS President