EQUATION OF STATE OF SEAWATER … THREE DECADES LATER

For 30 years, scientists have relied on a series of equations called ‘International Equation of State of Seawater’ – or EOS-80, a collective term representing more than three decades of oceanographic best practice information from the early 1980’s to present. Now, based on new oceanographic research, scientists have begun adopting a fresh approach to seawater thermodynamics, based in part on the work of Rosenstiel researcher, Dr. Frank Millero. Referred to collectively as the “Thermodynamic Equation Of Seawater – 2010,” or TEOS-10 for short, a new set of highly accurate and comprehensive formulas are beginning to provide much-needed adjustments and clarifications to the EOS-80, that may be accepted internationally as early as 2010.

A member of the original (Continued on page 2)

OH NO! PUBLIC BEACH STUDY FINDS BEACHGOERS AT INCREASED RISK OF STAPH

In the first large collaborative epidemiologic survey of its kind, researchers at the UM Rosenstiel School and the Miller School of Medicine found that swimmers using public ocean beaches increase their risk for exposure to staph organisms, and may increase their risk for potential staph infections once they enter the water. Swimmers in subtropical marine waters, especially those with open wounds or suppressed immune systems, are at a 37 percent higher risk of exposure to harmful staph bacteria, either their own or those of near-by swimmers who might carry the bacteria with them. Fortunately, results show

(Continued on page 3)
EQUATION OF STATE OF SEAWATER … THREE DECADES LATER
(Continued from page 1)

committee that established the EOS-80, and a major contributor to and
publisher of its latest revisions, Millero is a leading force in oceanic
chemistry research. His work alongside scientists from the United
States, Canada, Europe, Great Britain, and China is helping to guide the
comprehensive reevaluation and construction of a set of equations that
may well usher in sweeping advancements in the fields of marine and
atmospheric science.

The new equation of state is a free energy function that can yield all the
thermodynamic values of seawater of known temperature, salinity and
pressure. This is more convenient than EOS-80 for modelers who examine
the theoretical properties of seawater. Dr. Rainer Feistel, from the Leibniz
Institute for Baltic Sea Research in Germany, is widely recognized as the
pioneer in developing the new free energy function.

In 2005, the Scientific Committee on Oceanic Research (SCOR) and
the International Association of Physical Sciences of the Ocean (IAPSO)
established Working Group 127 on the “Thermodynamics and Equation
of State of Seawater,” or simply WG127. Since then this group has
arrived at a series of algorithms that incorporate oceanography's best
knowledge of seawater thermodynamics. The approach taken by WG127
has been to develop a Gibbs function from which all the thermodynamic
properties of seawater can be derived by purely mathematical
manipulations. This method ensures that the various thermodynamic
properties are self-consistent and complete. Named for physical chemist
J. W. Gibbs, that developed free energy equations that can be used to
study the thermodynamic properties of fluids. The new equation of state is based on a Gibbs function for seawater from which all the
thermophysical properties of seawater can be derived in a physically consistent manner.

The Gibbs function is a function of Absolute Salinity, temperature and pressure, which is a major departure from present practice
(EOS-80). The reason for preferring Absolute Salinity to Practical Salinity is because the thermodynamic properties of seawater are
directly influenced by the mass of dissolved constituents, or Absolute Salinity, whereas Practical Salinity depends of conductivity. If the
new approach to defining the thermodynamic properties of seawater is well received by the scientific community, the scientists hope that
TEOS-10 will become the new internationally accepted definition of seawater by 2010.

The work of the SCOR/IAPSO WG127 was funded in part by the Wealth from Oceans National Flagship, the U.S. National Science
Foundation (NSF), and the National Oceanic and Atmospheric Administration (NOAA).
the potentially virulent variety of antibiotic resistant staph, commonly known as MRSA, makes up less than three per cent of staph from the beach waters sampled during the study.

While people shouldn’t avoid beaches, the research team recommends taking precautions to reduce the risk of infection by showering thoroughly before entering the water and after getting out. More research is needed to understand how long staph (including MRSA) can live in coastal waters, and the uptake and infection rate associated with the beach exposures.

The work was funded through the NSF/NIEHS Oceans and Human Health (OHH) Center at the University of Miami Rosenstiel School, NSF SGER, Florida Departments of Health and Environmental Protection, CDC, and the EPA. Special thanks to all of the Rosenstiel School faculty, staff and students for their participation in the study.

FINE ARTS PHOTOGRAPHER DOCUMENTS MANSFIELD’S TURTLE TRACKING WORK

SeaWorld, Busch Gardens and the non-profit SeaWorld & Busch Gardens Conservation Fund have commissioned internationally acclaimed fine art photographer, Nicholas Price, to capture the story of the parks’ passion for animals and wildlife conservation. In late 2008, Price traveled to select Florida-based projects supported through grants from the SeaWorld & Busch Gardens Conservation Fund. Included among these selected projects is one conducted by UM Rosenstiel School Postdoctoral Associate Dr. Katherine Mansfield. Working with Florida Atlantic University Assistant Professor Dr. Jeanette Wyneken at the Gumbo Limbo Nature Center in Boca Raton, Fla., her research is exploring new, small-scale tagging technologies capable of tracking the early dispersal and survivorship rates of neonate loggerhead and leatherback turtles off the southeast Florida coast.

Mansfield's work will help other scientists characterize when and how hatchling dispersal patterns spatially diverge, and comparatively characterize offshore nursery habitats, including oceanographic features that may influence dispersal. Ultimately, the project will provide data to management agencies, allowing them to refine species survivorship estimates.

Wyneken's lab at Gumbo Limbo is part of an eco-education complex operated as a partnership between the City of Boca Raton, Gumbo Limbo Nature Center Inc., Florida Atlantic University, and the Palm Beach County School System. Price snapped images of the researchers testing tag attachment methods on post-hatchling loggerhead turtles. Like many of the turtles raised at the center, these animals will serve as valuable scientific ambassadors, providing insight into the early life history and behavior of Florida's sea turtles.

Very little is known about what happens to sea turtles from the time they leave their natal beaches until decades later when they return to near-shore waters as large juveniles or adults, so the work Mansfield and Wyneken are conducting looks to fill a very large data gap in the understanding of these protected animals.

Price’s photographic journey will continue throughout 2009 as he documents the work of conservationists and scientists in traditional film medium and hand made prints. Price will produce a series of art prints - in color, and black and white - that will illustrate the critical wildlife conservation efforts being undertaken by the SeaWorld & Busch Gardens Conservation Fund.
‘CURRENT MAPPING’ SATELLITE TECHNIQUE GARNERS ONR FUNDING

Working closely with the Rosenstiel School's Center for Southeastern Tropical Advanced Remote Sensing (CSTARS), Associate Professor of Applied Marine Physics, Dr. Roland Romeiser, has been awarded a $500,000 grant by the Office of Naval Research (ONR) for his project “Currents in Rivers Observed by Spaceborne Along-Track InSAR (CuRiOSATI).” The funding comes on the heels of Romeiser's recently submitted manuscript detailing the use of a new technique called ‘along-track interferometric synthetic aperture radar’ (along-track InSAR); a method that uses high-resolution satellite imagery from a single observation for direct measurements of surface current fields. The experiment marks the first ever composition of a current field obtained from an instrument like this on a satellite.

Initially, experimental along-track InSAR data from the German satellite TerraSAR-X were acquired over the Elbe River in Germany in spring 2008 and processed at the German Aerospace Center (DLR) in December 2008. Romeiser analyzed the amplitude and phase images (figures a and b, covering an area of about 16 km x 25 km) and applied corrections in such a way that a solution for the most likely line-of-sight surface current field at the time of the satellite overpass was obtained (figure c). A comparison with a numerical flow model from the German Federal Waterways Engineering and Research Institute (BAW) shows good agreement.

High-resolution current measurements from space can be attractive for a variety of applications including river runoff monitoring, bathymetry monitoring in coastal waters with strong tidal currents, the siting of current turbines for electric power generation, pollution monitoring, support of rescue operations and navy operations, as well as basic research on kilometer-scale turbulence patterns in the open ocean. Romeiser and his collaborators are planning to acquire more TerraSAR-X along-track InSAR images in 2009 to develop and implement quasi-operational algorithms for satellite-based current measurements at CSTARS. Romeiser’s grant will help fund further research on the technique’s suitability for river applications.

Name something that you couldn’t live without.
I couldn’t live without my family and good friends.

If you become a millionaire, what would you do first?
I would probably take my family on a nice vacation. Everyone needs to get away sometime, plus I've always wanted to travel to an exotic destination.

If we spend over 10 hours a day with you, what should we know about your personality?
My personality is funny, goofy, shy and serious. I like to have fun and surround myself with positive people and positive vibes. You would learn that I am very focused at times. Everything has to be structured and in order. But other times, I am very easygoing and laid back. I'm a very patient person (except when it comes to driving) and I'm very hard working and easy to get along with.
LETSON NAMED CHAIR OF MAF

The University of Miami’s Rosenstiel School of Marine and Atmospheric Science announced that Dr. David Letson has been elected chair of the Division of Marine Affairs and Policy (MAF). Letson, who has been with the School for 14 years, is a professor, a member of the Council of Economic Advisors for Florida TaxWatch, and participates in a multi-disciplinary evaluation of climate forecasting for agricultural and water resources management in the southeastern U.S. and Argentina, as part of the Southeastern Climate Consortium (SECC).

Letson’s research at UM’s Rosenstiel School focuses on natural resource economics, particularly on extreme weather and climate variations. As an economist, he is interested in the value of hurricane forecasts and in how hurricane track forecasts are interpreted and used. In one research project, he is helping develop an internet-based survey approach to estimate the economic value of hurricane forecast attributes. In another project, Letson has helped create an electronic futures market to advance understanding of how hurricane track forecasts are interpreted and used. He also serves as a member of NOAA’s Hurricane Forecast Socio-Economic Working Group, convened by NOAA and the National Center for Atmospheric Research to develop a hurricane social science research agenda.

Letson is a member of the NOAA Science Advisory Board's Oceans and Health Working Group, convened to evaluate NOAA's ocean health science efforts and their potential contributions to public safety and societal well being and to provide scientific advice regarding these efforts to NOAA. He also serves on NOAA’s Hurricane Socioeconomic Working Group, established by the National Weather Service and the Office of Atmospheric Research to develop a hurricane socio-economic research agenda.

MAKING A DIFFERENCE

Jennifer Roshaven, executive assistant to Dean Otis Brown, is currently a member of the Leadership Miami Class of 2009. An annual program targeted toward professionals interested in making Miami a better place to live, work and play. Leadership Miami's mission is to cultivate leaders from all segments of our community by educating, developing and encouraging individuals to be active leaders in their community and the Greater Miami Chamber of Commerce.

As part of the program's community service initiative, Roshaven and a team of other South Florida leaders will be sponsoring the First Annual Alvah H. Chapman, Jr. Memorial Donation Drive for the Community Partnership for the Homeless. This ONEMiami project, is comprised of a group of committed professionals working to improve the future of Miami-Dade County and the lives of those who reside in it. The drive will focus on those items most needed by the Community Partnership for the Homeless, Inc. (CPHI) and the residents of their Homeless Assistant Centers in the City of Miami and the City of Homestead, including men's clothing, home furnishings for individuals transitioning into permanent housing, milk/orange juice, blankets, diapers, socks/undergarments, bed linens, towels, toiletry items, strollers and high chairs. Donations can be dropped off at any time at CPHI, or arrangements can also be made for CPHI to pick up donations from your home. Roshaven is focusing on collecting school supplies, craft supplies, and backpacks for the children living at CPHI that are unable to complete homework assignments and science fair projects. These items can be brought to SLAB 107 between now and March 27th. The drive will culminate in the First Annual Alvah H. Champman, Jr. Memorial Donation Drive to be held March 29, 2009 at CPHI’s downtown Miami location, and will be continued by the center’s Young Professional Board of Director’s for years to come.

A Fishy Wish

This year, 14-year-old Elizabeth lived out her dream of becoming a marine biologist for a while; she swam with sharks and met marine biologists and students at the Bimini Biological Field Station. Hosted by Rosenstiel School Professor Emeritus Dr. Sam Gruber, Elizabeth and her family were flown to Bimini by the Make-a-Wish Foundation for several days of hands-on activities that every junior shark biologist should learn. This is the third such activity conducted at the Bimini, the last one occurring nearly a decade ago.
Welcome to the New Rosenstiel Library Website!
Our librarians, in collaboration with the UM Libraries Webmaster, have developed a new and more functional website for Rosenstiel School patrons. The aim of the new site is to provide users with updated information, to make the resources we offer easier to locate and to improve the website design and appearance. The new website is available at http://www.library.miami.edu/rsmaslib/. The old site will be turned off in late Spring 2009. Users will be redirected to the new site once the switch is made. We encourage all library patrons to take a look at the new website, give it a spin and let us know your impressions!

Library Resources Training Sessions occur at regular intervals throughout the semester and are available by appointment. Come learn about the resources available to you.

- Citation Searching: This session will focus primarily on citation searching in Web of Science but will also introduce other citation resources such as Scopus and Google Scholar. We will also review basic citation metrics. If you have questions concerning citation searching in advance of training please contact Lisa Fish, efish@rsmas.miami.edu.
- ASFA Database Training

Discover Darwin
As part of the Charles Darwin Bicentenary celebration at RSMAS, the library is exhibiting a selection of books and other materials by and about Darwin. These publications are from our collection; the books are available for loan following the exhibit. Stop by and check them out!

MEET ‘DARWIN’
Darwin, the resident croc’ and science mascot at NOAA’s AOML facility.

IN REMEMBRANCE
Ms. Tatiana Furry, who was a crewmember aboard the R/V Walton Smith. Tatiana was killed in an automobile accident in Miami. Though she was a crewmember for only a short time she leaves us with memories of her warm smile, energetic attitude and good work aboard the Walton Smith. She is dearly missed. Sign her guestbook at: http://www.legacy.com/Broward/DeathNotices.asp?Page=LifeStory&PersonID=123244748
NEW CORAL REEF FUTURES WEB PAGE

The Baker Lab at the University of Miami focuses on studying the biology, ecology and conservation of coral reefs with an interdisciplinary approach that focuses primarily on the impacts of climate change on these ecosystems. In an effort to provide great access to their work, a new Web page has been established for the lab. It features recent lab news, a multimedia library and research projects. Please visit: www.rsmas.miami.edu/groups/reef-futures. Special thanks to Dr. Andrew Baker, Rachel Silverstein, Oana Ioncel, Christian Howard, and the entire Baker Lab crew!

NOSB MANATEE BOWL RECAP

Brain power, not athletic prowess, was on display at the Rosenstiel School when almost 100 students from high schools throughout eastern Florida competed in a regional competition of the National Ocean Sciences Bowl, better known as the Manatee Bowl. Students participated in a “Jeopardy-like” contest that focused on principles of ocean science. Preliminary rounds were held at Mast Academy, with the finals being held at the University of Miami’s Rosenstiel School Auditorium. A team of students from Hialeah-Miami Lakes High School defeated South Broward High School, earning a trip to the national competition in Washington, D.C., April 25-27 at the Smithsonian Museum of Natural History’s Ocean Hall. Special thanks to all volunteers for their hard work and bright spirits!
FACILITIES UPDATE

There have been great upgrades to our recycling program! Take advantage of the School's new Single Stream recycling capabilities and do your part to help UM lead the RecycleMania contest!

If you would like a box for office paper recycling in your office, but don't currently have one, e-mail msgso@rsmas.miami.edu with your office number and they will deliver one to you. You are responsible for emptying this box into the office paper bin nearest you.

REMEMBER: If unauthorized items are found in the recycling receptacles, the entire contents may be thrown in the garbage. Read all posted signs!!!

NEW items that can now be recycled at RSMAS:

- Toner/ink cartridges – under SLAB stairs
- Old cell phones – under SLAB stairs
- Magazines – in Single Stream under SLAB stairs, in library, between Commons and Collier
- Phone books - in Single Stream under SLAB stairs, in library, between Commons and Collier
- Paperboard (e.g. cereal boxes) - in Single Stream under SLAB stairs, in library, between Commons and Collier

What materials can I place in the new single stream recycling cart?

- Paper Products: newspapers, magazines, catalogs, telephone books, printer paper, copier paper, mail, all card board, other officer paper without wax liners
- Cardboard: packing boxes, cereal boxes, gift boxes, corrugated cardboard; flatten all boxes prior to placing them in your cart
- Plastic Containers (narrow necks only): bottles (without caps or lids), milk, water, detergent and shampoo containers (without caps) glass
- Aseptic Containers: polycoated drink boxes, juice cartons, milk cartons
- Glass: glass food & beverage containers (clear, brown and green)
- Metals: aluminum & steel food and beverage containers.
- Plastic: Only plastic containers with the triangle label symbol #1, #2, #3, #4, #5, #6, #7 can be recycled at this time. You'll find these numbers on the base of the container. (narrow necks only)

What is not allowed in the cart?

- Garbage or other non-recyclable waste such as gas cylinders, tanks, rocks, dirt, building debris, batteries, flammables.
- Batteries - dry cell batteries, lead acid batteries
- Certain glass products -window or auto glass, light bulbs, mirrors, glass cookware or bake-ware, ceramics
- Plastic bags
- Styrofoam
- Home chemicals – paints, pesticides items you should not place in cart
- Medical waste and pharmaceuticals
- Electronic waste and accessories- PCs, monitors, televisions, printer cartridges, keyboards, cell phones, CDs and DVDs
- Other non-recyclables - Coat hangers, small appliances, microwave trays
POTENTIAL STUDENTS SOAK UP ROSENSTIEL HOSPITALITY

The Rosenstiel School hosted a graduate student recruitment event during the first weekend in February. Thirty students from around the country including a few graduating undergrads from the University of Miami, were flown in to participate in an all-day open house on Friday, February 6.

The first day began with an overview of the school by Associate Dean Dr. Larry Peterson, followed by an afternoon of meetings with faculty and current graduate students. The day culminated in a showcase of twenty-seven scientific posters presented by current Rosenstiel students, and then a festive Mardi Gras Party co-hosted by the Graduate Studies Office (GSO) and the Marine Science Graduate Student Organization (MSGSO) in The Commons. Parties by Pat catered a Cajun dinner of po’ boys, jambalaya and red beans and rice, while everyone enjoyed the zydeco music.

On Saturday, February 7, Drs. Peterson, Chidong Zhang and Lynne Fieber hosted a field trip to Everglades National Park for the prospective students. They spent the day on the Anhinga Trail observing wildlife and South Florida’s colorful flora.

MAKING THE MOST OF MIAMI

No matter where you live, finding the most reliable and cost conscious businesses in your area is important. Since word of mouth from trusted friends and colleagues is always a valuable tool, marine geology and geophysics Ph.D. student David Weinstein has begun compiling a list of recommendations for various types of services in and around South Florida. The list can be found at http://www.rsmas.miami.edu/msgso/. For further submissions, please send your recommendations to David Weinstein at dave090@gmail.com.
INAUGURAL STUDENT SCIENCE PARTY A BIG HIT!

Twenty-eight students from all six of the Rosenstiel School's academic divisions presented posters of their research at the First Annual RSMAS Student Science Party co-hosted by MSGSO. Research topics ranged from coral resiliency in response to pCO2 in Florida Bay to evidence for multiple magma bodies beneath Kilauea Volcano, Hawaii. Posters were displayed in the RSMAS Commons for the entire community to learn about ongoing student research activities while enjoying refreshments. MSGSO would like to thank Dr. Chidong Zhang and Graduate Studies for their help and support to make this event possible. In addition, they would like to thank the Office of Advancement, Peter Vertes, Dean's Office, Outreach, and Sue Ebanks for the use of tack boards and easels.

Photos and content contributed by: Kelly L. Jackson and Tauna Rankin

‘KEY’ CONSERVATIONIST INDUCTED INTO HALL OF FAME

In acknowledgement of more than three decades of exceptional conservation efforts and fishing achievements, Key Biscayne resident and long-time supporter of the Rosenstiel School, Capt. Joan Vernon was recently inducted into the 2009 Big Game Room Hall of Fame during the 2009 Miami International Boat Show. Vernon has been a fervent champion of the use of circle hooks over the use of “J” hooks for the safe release of billfish and raised funds for studies on the use of circle hooks as a conservation tool to further reduce billfish mortality.

Vernon showcases her support of Rosenstiel students and research through her work with the Yamaha Contender Miami Billfish Tournament, of which she is a founding member; the Captain Harry D. Vernon, Jr. Memorial Scholarship honoring the late Captain Harry D. Vernon, Jr. - awarded annually to students studying billfish conservation research; and the Circle of Friends Memorial Scholarship honoring Jim Hardie - awarded annually to students studying fisheries science and management. In addition, the Tournament sponsors the School's annual Marine Conservation Night and supports the School's Experimental Hatchery and the work of researcher, Tom Capo.

Established in 1986 by the late Winthrop P. Rockefeller, The Billfish Foundation is the only non-profit organization dedicated solely to conserving and enhancing billfish populations worldwide. With world headquarters in Ft. Lauderdale, Fla., TBF's comprehensive network of members and supporters includes anglers, captains, mates, tournament directors, clubs, sport fishing and tourism businesses. By coordinating efforts and speaking with one voice, the organization works for solutions that are good for billfish, not punitive to recreational anglers and good for the local economy.
LIGHTS, CAMERA, EVOLUTION!

Dr. Richard Milner, a physical and cultural anthropologist, author of the Encyclopedia of Evolution and regular contributor to Natural History magazine, performed his one-man musical performance, “Charles Darwin: Live and in Concert,” at the Rosenstiel School this February. Milner entertained and enlightened the audience with his musical production at the Rosenstiel School Auditorium this February.

Darwin Day is an international celebration of the life and scientific accomplishments of Charles Darwin. The year 2009 marks the 200th anniversary of Darwin’s birth and the 150th anniversary of the publication of his groundbreaking On the Origin of Species. The Ocean Research and Education Foundation sponsored the presentation, in partnership with the Rosenstiel School of Marine and Atmospheric Science at the University of Miami. Special thanks to Dr. Robert Ginsburg, Dr. Otis Brown, Adam Harrison, Mike Anderson, Oana Ioncel, Barbra Gonzalez, Laura Bracken and Christian Howard for helping with the event.

ALUMNI UPDATE

2000S

Patrick Rice, Ph.D. ‘08, MBF, director of Marine Science at Florida Keys Community College (KFCC) - Key West, has been busy improving the present Associate in Science (AS) program in Marine Environmental Technology by updating old and developing new contemporary courses. In addition to the current Associate in Arts (AA) degree in Marine/Aquatic Biology offered at FKCC, Rice is developing curriculum for a four-year Bachelor of Science degree in Marine Biology with three distinct degree tracks, including ecology/conservation, fisheries science, and aquaculture. He has been very proactive in establishing partnerships with various marine businesses and organizations, and this semester is teaching a Basic Research Diving course and an online Survey of Mariculture (i.e. marine farming) course.

Rice’s work on shark repellents was also featured in a January 2009 episode of Jose Wejebe’s Vida Del Mar on ESPN. The segment featured a demonstration of bonnet head and nurse shark magnetoreception.

1970S

Jon C. Staiger, Ph.D. ’70, MBF. After a long career as Natural Resources Manager for the city of Naples, Fla., Jon now works with the Naples engineering company, Coastal Engineering Consultants, Inc., and has moved to Baton Rouge, LA where the company is involved in several barrier beach/island/marsh restoration projects in the Mississippi Delta.

THE LAST WORD

“In the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed.”

- Charles Robert Darwin
(Feb. 12, 1809 – Apr. 19, 1882)