Rutgers Marine Science Wraps Up A Very Successful Year of Garnering External Support

July begins the new fiscal year and provides us one metric on the strength of Rutgers marine science. By all accounts Rutgers marine science is extremely healthy. The last year was the most successful year for RU marine science, garnering $18,962,393 in funds. Funds were provided by state and federal agencies, non-profit associations, private companies and philanthropic foundations. The programs are funding expeditions to all ocean basins, and developing new technologies ranging from new sensors to cyberinfrastructure tools. These projects enable the development of education programs, and a range of community engagement activities. This month we will highlight some new research programs that represents only a fraction of the exciting ongoing marine science research projects at Rutgers. Many projects have live updates and streaming data. Check out Yair Rosenthal as he leads the IODP expedition sampling the Pacific warm pool at https://iodp.tamu.edu/scienceops/expeditions/pacific_warm_pool.html. Check out live video streaming from 250 miles off the Oregon coast, 1 mile underwater every 3 hours each day at http://oceanobservatories.org/streaming-underwater-video/ provided by the Rutgers OOI team. As always, check out the real-time data collected by satellites, coastal surface currents, and underwater gliders at https://rucool.marine.rutgers.edu/data.

New Grants

Paul Falkowski “STEP 1: Chemical Transformation of Minerals by Light & the Evolution of Prebiotic metabolism” NASA $140,517

Gary Taghon “Continued Development of a Benthic Invertebrate Index for Barnegat Bay” SNJDEP $29,792

Robert Kopp “NRT Traineeship Coastal Climate Risk and Resilience” (EOAS) NSF $2,999,055

Janice McDonnell “Teaching Undergraduate Oceanography Courses with OOI Data Through Faculty Workshops” NSF $99,909

Cristina Dura “Quantifying Megathrust Earthquake Ruptures with Coastal Stratigraph & Tsunami Simulation, South Central Chile” NSF $258,060

Elisabeth Sikes “Pacific Ocean Stratification since the last Ice Age New Constraints from Benthic Foraminifera” NSF $104,926

Benjamin Horton “Collaborative Research: Paleoseismic Evidence of Earthquakes and Tsunami’s Along the Southern Part of the Japan Trench” NSF $97,954

Grace Saba “Mid-Atlantic Regional Resilience: Linking Coastal Ocean Information to Enhance Economic, Social and Ecological Resilience” MAROC-NOAA $68,828
Building a novel graduate education program focused on the Coastal Climate Risk and Resilience

The nation’s coasts are home to much of the American population. They play an important role in the US economy and support many valuable ecosystems. A National Science Foundation Research Traineeship (NRT) award to Rutgers University will prepare the workforce that will build coastal resilience in the face of climate risks. Individuals at the MS and PhD levels will be trained to conduct research that integrates all elements of coastal systems while learning to communicate effectively with coastal stakeholders in defining research problems, conducting research, and applying research to address real-world resilience challenges. The project anticipates training approximately one hundred (100) MS and PhD students, including twenty (20) funded trainees, from the Earth system sciences, social sciences, and engineering. Congratulations to Bob Kopp who is leading this effort.

Developing ocean pH sensors for underwater gliders

Ocean acidification (OA) has significant scientific and societal ramifications including the alteration of ocean biogeochemistry, ecological consequences associated with altered ecosystems, and economic losses due to the decreased survival of commercially important organisms. Yet few time series and high resolution spatial and temporal measurements exist to track the existence and movement of low pH and low carbonate saturation water, specifically in coastal regions where finfish, lobster, and wild stocks of shellfish are located. Grace Saba, with partners from Woods Hole, have been funded to develop the integrated glider platform and sensor system for sampling pH and possibly low carbonate saturation water in the water column of the coastal ocean on a regional scale. This project will result in a new commercially available glider pH sensor suite that will provide the foundation of what could become a real-time national coastal OA monitoring network with the capability of serving a wide range of users. Additionally, the integration of simultaneous measurements from multiple sensors on one glider will allow one to distinguish interactions between the physics, chemistry, and biology of the ecosystem.

Studying Pacific Ocean stratification since the last ice age

Ocean circulation is thought to have played a key role in the transition from the last ice age to the modern interglacial (Earth’s most recent “deglaciation”). However, the lack of a mechanistic explanation for the deglaciation represents a major limitation in our understanding of the ocean-climate system. Elizabeth Sikes will lead a collaborative program that will build multiple high-resolution records of seawater temperature and other physical properties from the Southwest Pacific Ocean using geochemical evidence from marine sediment cores. This collaborative work will strengthen ties between the participating universities and provide practical
training for graduate and undergraduate students in the sciences. The project's marine records will extend from the last ice age through the present, providing a detailed history of seawater properties that will shed light on the ocean's role in global climate change.

Understanding future mosquito populations with a changing environment

A new project led by Rick Lathrop, Dina Fonseca, Mike Kennish and Lisa Auermuller in collaboration with Scott Crans (New Jersey Office of Mosquito and Control Coordination) is funded to investigate the “Interconnectedness of Climate Change, Nuisance Mosquito Populations, and Long-term Resilience of Coastal Salt Marsh Systems”. The team is focused on understanding the interactions between sea level rise, salt marsh structure, habitat modification/restoration, and nuisance mosquito populations which can pose serious health risks to humans, livestock, and pets. Chief concerns are how climate change and sea level rise may affect marsh habitats and consequent mosquito production and also how past physical alterations to reduce mosquito habitat affects the ability of salt marshes to maintain their relative elevation position and thereby their long term resiliency in the face of sea level rise.

Looking into past disasters to better understand the potential dangerous events in the future

Ben Horton has been funded to study tsunami history. There is an extensive instrumental, historical, and geological record of tsunamigenic-earthquakes originating from the northern and middle parts of the Japan Trench that documents the last several thousand years of earthquakes and tsunamis, including the magnitude 9 Tohoku earthquake in 2011. This earthquake ruptured five segments along the northern and middle parts of the Trench, but failed to rupture through the southern part, which is near metropolitan Tokyo. The seismic risk for this portion of the trench is uncertain because of the possibility that stress transferred southwards during the 2011 earthquake and that this part of the subduction zone is locked. A research team from Rutgers University and the University of Southern Mississippi in collaboration with Japanese researchers will employ an innovative combination of field, laboratory (sedimentary, microfossil, and radiometric analyses), statistical, and modeling techniques to a series of possible tsunami deposits in order to determine the tsunami and earthquake history of the southern Japan Trench. Data very important for preparing for future disasters.
GET YOUR RU OCEAN SWAG!!!!

Rutgers Oceanography tee-shirts are here. Proudly wear the Rutgers Oceanography tee-shirts - funds are raised to host science socials for the undergraduate and graduate students. Tee-shirts go for $15 and will make you look athletic, smart, and dashing. Such a great deal for a great cause. Contact Sarah Kasule if interested (kasule@marine.rutgers.edu). To see the quality people your contribution would support check out our featured graduate students at http://marine.rutgers.edu/main/Featured-Student/.

Please help us enable Rutgers oceanography to support the next generation!

Rutgers oceanography needs your support to meet the environmental and educational challenges facing the world today. Your support is critical to enabling high risk and high reward research, developing students to be the leaders of tomorrow and bringing the public with our scientists into the ocean. Your private gifts will create new laboratories, student fellowships, endowments and feed ambitious new programs. Come join us! Even the smallest gifts have huge impacts by getting students out on the water or getting a student to a professional meeting. So please join us explore the world. Go RU!

New Publications


Graduate student, Rachel Gula’s research focuses on the development of symbiotic relationships at the larval stage. This past summer, her research took her to the island of Palau.