Intern Corner

SERC's internship program has grown by leaps and bounds. This summer alone we hosted 40 interns! Following are a list of the summer interns, as well as several paragraphs and articles that the interns themselves have written describing their research.

Summer 2001 interns:

Denise Akob, St. Mary's College of Maryland; Animal/Plant Interactions, Dr. Candy Feller.

Allison Amavisca, Francis Marion University; Crab Lab, Drs. Tuck Hines and Jana Davis.

Julia Blum, Tufts University; Crab Lab, Dr. Tuck Hines and Libby Jewett.

Dale Booth B.A.'s. in Biology and Environmental Science, Lewis and Clark College; Invasions Ecology, Dr. Greg Ruiz.

Kimberly Briggs, Towson State University; Terrestrial Animal Ecology, Dr. Pete Marra.

Gregory Bulte, Saint-Foy College; Terrestrial Animal Ecology, Dr. Pete Marra.

Laura Carrier, St. Mary's College of Maryland; Crab Lab, Dr. Tuck Hines.

Audrey Colnar, B.S. in Biology, University of Southern Colorado; Invasions Ecology, Dr. Greg Ruiz.

Aaron Coston, Morgan State University; Protistan Ecology, Dr. Wayne Coats.

Franck Dhennin, M.S. Candidate; National Engineering School of Agronomy and

SERC interns on an intern trip to Six Flags Park. (l-r) Aaron Coston, Dale Booth, Sandy Smith, Ally Amavisca, Branwen Williams, Laura Carrier, Matt Stadler.

In their own words:

Christina Fedarcyk

As an intern for SERC this summer, I work in the Phytoplankton Lab for Dr. Charles Gallegos. Phytoplankton is an important determinant of water quality so continual monitoring of algae in the Chesapeake Bay is necessary. I am currently working on two projects for this summer. In one, I work with cultures of *Prorocentrum minimum*, the algal species responsible for the "red tides" seen in the bay during the springtime. I am growing cultures in media of three different nutrient levels and monitoring cell growth and chlorophyll in order to see if *P. minimum* have the capability to grow on internally stored phosphate. In my second project I work with two types of benthic (bottom sitting) chambers and I monitor the consumption of phytoplankton by benthic organisms in the Rhode River. Half of my tubs have open bottoms so the water I sample from them is exposed to benthic grazers and half of the tubs are closed bottomed which isolate them from the bottom. Water samples taken from the tubs are filtered and analyzed for chlorophyll content.

In their own words:

Adam Tavel:

While many interns at the Smithsonian Environmental Research Center study plants and animals, my summer project deals with the study of people. SERC has had over 400 interns since 1972, and yet there has never been a comprehensive study to document these interns and their research. My project utilizes computer technology to transfer archaic data from document to database, thus preserving it for future generations in a more modern way. Once this lengthy process is complete, I will conduct both a demographic and statistical analysis of past interns, so that we might glean some general information: How old is the average intern? What parts of the country do interns come from? How have stipend amounts changed over time? These are just a few of the questions I expect to answer. By knowing where we have been, we can make better decisions for tomorrow, and I hope my research will contribute to the growth and development of the intern program.

Food Sciences, France; CO_2 Lab, Dr. Bert Drake.

Kelly Dobbins, B.S. in Environmental Science, University of Miami; Canopy Lab, Dr. Jess Parker.

Kailehia duPree, Morgan State University; Terrestrial Animal Ecology, Dr. Pete Marra.

Christina Fedarcyk, University of Notre Dame; Phytoplankton Lab, Dr. Chuck Gallegos.

Brigid Franey, St. Olaf College; Canopy Lab, Dr. Jess Parker.

Sara Gomez Garcia, Undergraduate Degree Equivalent, University of Cordoba, Spain; Plant Ecology Lab, Dr. Dennis Whigham.

Juliette Gosset, Undergraduate Degree Equivalent, Institut National Agronomique, France; CO_2 Lab, Dr. Bert Drake.

Lisa Green, Morgan State University; Terrestrial Animal Ecology, Dr. Pete Marra.

Kymberly Henley, Morgan State University; Invertebrate Ecology Lab, Dr. Livingston Marshall (working with Dr. Tuck Hines).

Laurie Klotz, B.S. in Biology and

In their own words:

Sara Gomez

PawPaw (*Asimina Triloba*): Population dynamics and Clonal Integration

During my internship (July-September 2001) at the Smithsonian Environmental Research Center, I will focus on the study of the species *Asimina triloba*. This is a clonal species that can be found in the understory of temperate woodlands in eastern North America.

We will look at the dynamics of several populations located at the SERC property, which have been measured over the past two years and will continue to be followed for an unknown number of years in the future. Thus, we will have an idea of the mortality and natality rate, as well as the structure and dispersion of populations of different sizes under similar conditions.

PawPaw (*Asimina Triloba)*

Complementary to the demography study I will be measuring the response in time of clones to a severing treatment. The aim of this experiment is to analyze the capacity of the plants to recover after being disconnected from the rest of the population. This experiment shows the importance of *Clonal Integration* in this species.

In their own words: *Denise Akob*

The Role of Epibiont Sponges in the Nutrient Limited *Rhizophora mangle* (Red mangrove) stands.

by Denise Akob and Chris Ellison

Rhizophora mangle, or red mangrove, is a tree species specially adapted to obtain the majority of its required nutrients from salt water. Red mangrove forests are found in coastal regions with water temperatures greater than 23°C, conditions existing primarily within 25° latitude of the equator. The habit created by the trees is often important in maintaining coastlines by creating a check on erosion. Along the intertidal region of the mangrove forests on off-shore mangrove islands in Belize, growth of the trees is limited by the availability of nitrogen. We hypothesize that nutrient acquisition is positively affected by marine epibiont communities in the mangroves. In this context, epibionts are organisms that live on the tree roots that extend into the water column surrounding the trees, including shellfish, algae, sponges and tunicates. The focus of this study is an examination of the role of sponges as epibionts on the red mangroves. Sponges are filter-feeding animals that have symbiotic microbes living within their tissues. These microbial communities are diverse with some members having the ability to process nitrogen.

In our study, we hope to describe the structure of the symbiont community within the sponge and the role this plays in the mangrove ecosystem of Twin Cays, Belize. Our project included a research trip to the Smithsonian Marine Field Station on Carrie Bow Cay, Belize, which is adjacent to Twin Cays. The samples collected from Twin Cays were frozen and shipped to the United States for further analysis under laboratory conditions. Presently, molecular techniques are being used to examine the members of the bacterial symbiont community within the sponge in order to bring to light the relationship between sponges and the red mangrove trees. This project is currently under construction and results are expected over the next few months.

The red mangrove stilt roots that line all channels, creeks, and ponds at Twin Cays. Below tide level, these structures support a diverse community of sessile epibionts, including sponges, algae, tunicates (sea squirts), anemones, and many associates. They also provide habitat for many mobile animals, such as crabs, lobsters, brittlestars, and fishes.

The mangrove forests are threatened environments. In order to adequately protect this environment, it is necessary that we understand the complex role of all organisms that make up the ecosystem. This research has awakened our intellectual curiosity and we hope that it will have an impact on future understanding and enjoyment of the mangrove ecosystem.

This project is a collaborative effort with Dr. Ilka C. Feller (SERC, mentor for D.M. Akob) and Dr. S. Craig Cary (University of Delaware, mentor for C. Ellison). Support for field research is provided through the Caribbean Coral Reef Ecosystems Grant program. A special thanks to Dr. M. Cristina Diaz for her assistance on the field research in Belize.

In their own words:

Tori Ziemann

Phosphorus is an important element in fresh and saline waters. In fresh waters, phosphorus limits plant production, but in saline waters nitrogen limits growth. In this study, supervised by Dr. Tom Jordan, we are looking at a gradient from fresh to saline waters in the Patuxent River to see how the change of limiting elements occurs. My research project for the summer looks at the fractions of inorganic phosphorus in the sediments, which is where most of the phosphorus is stored and released. By looking at fractions bound to iron, we can see how the chemistry of the phosphorus changes as salinity changes.

Nutrient lab intern Tori Ziemann looking at fractions of inorganic phosphates in a sediment sample from the Patuxent River.

Environmental Science, Duke University; Invasions Ecology, Dr. Greg Ruiz.

Mia Levine, M.S. Candidate, University of Illinois; Animal/Plant Interactions, Dr. Candy Feller.

Julio Lorda-Solorzano, B.S. in Biology and Aquatic Ecosystems, Universidad de Guadalajara; Invasions Ecology, Dr. Greg Ruiz.

William Metcalfe, B.S. in Biology, University of Pittsburgh, Johnstown; Crab Lab, Dr. Tuck Hines.

Cary Miller, Ohio University; Education Dept., A. Mark Haddon.

Melissa Mitchem, B.S. in Environmental Science, University of Iowa; Ecological Modelling Lab, Dr. Don Weller.

Janice Pereira, B.S. in Biology, Cornell University; Animal/Plant Interactions, Dr. Candy Feller.

Algernon Prioleau, M.S. Candidate, Morgan State University; Invasions Ecology, Dr. Greg Ruiz.

Quinn Roberts, B.S. in Marine Biology, University of South Carolina; Nutrient Lab, Dr. Tom Jordan.

Michael Rubinstein, University of Maryland; Ecological Modeling Lab, Dr. Don Weller.

Emmanuelle Schindler, College of

In their own words:

Melissa Mitchem

The Ecological Modeling/ Spatial Analysis Lab. is especially interested in the nutrients present in stream water and their relationships with land use and other geographic characteristics of watersheds. Our lab applies computer technology to the analysis of ecological questions. Geological Information Systems (GIS) and Remote Sensing (RS) are types of computer programs that display and analyze spatial data. These programs can help analyze satellite images or aerial photographs to categorize land as forest, crop, urban, water, and other land uses. Nutrient measurements taken at various stream sampling stations can then be compared to the land types in the streams' watersheds. We can also use the results can to predict nutrient discharges from other watersheds.

My project deals with the classification of land use from satellite images. The classification results depend on the source of the image and the classification methods used. Therefore, individuals may arrive at different conclusions when categorizing land use for the exact same area. My goal is to estimate the errors associated with the categorization of land use and to see how those errors affect predictions about nutrient discharges from watersheds.

In their own words:

Laura Carrier

CrabLab intern Laura Carrier explains fish and invertebrate species found locally in the Rhode River to interns from the Center for Research Conservation and the National Museum of Natural History.

As an intern in the Fish and Invertebrate Lab (CrabLab), I am studying juvenile blue crabs (*Callinectes sapidus*). I am working to find a short-term tag that remains on a crab's carapace until it molts and a long-term tag that remains through a crab's molt. The development of a fast and inexpensive tag is a challenge and has been the limiting factor in furthering our knowledge about the life history of the blue crab. After determining the most successful tagging procedure, I will conduct release and recapture experiments to learn how fast crabs will move from a dispersal site and whether they prefer a specific structure as a habitat. I will release the tagged crabs into bare sediment, artificial sea grass beds, oyster reefs, riprap, and coarse woody debris and recapture them at a set time period afterwards using caissons (large metal boxes set upon the habitat that traps all organisms inside), and a seine net. These preliminary experiments are part of a large study in conjunction with the Center for Marine Biotechnology in Baltimore.

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Janice Pereira

In the plant-insect interactions lab at SERC I study interactions between three organisms: the Sea Shore Mallow- a native swamp plant; a fly that lives within its stems; and a wasp parasitoid that lives in the fly. The adult fly (a gall midge) invades by using its ovipositer to lay eggs in the central part of the stem causing it to swell up to form a gall. The larvae hatch and feed on living plant tissue. At some point during larval development, a parasitoid seeks out the plant, either visually or by chemical cues, and lays her eggs within the developing fly. I study the variation of gall size and length within a site and also between sites around SERC. This involves collecting and dissecting many galls and identifying the numbers and types of organisms living inside.

William and Mary; Photobiology Lab, Dr. Pat Neale.

Joanna Smith, University of Maryland; Education Dept., A. Mark Haddon.

Sandra Smith, Shippensburg University; Biogeochemistry Lab, Dr. Pat Megonigal.

Matthew Stadler, Undergraduate Degree in Botany and Zoology, University of Western Australia; Invasions Ecology, Dr. Greg Ruiz.

Adam Tavel, Lebanon Valley College; Fellowship Office, Kim Sproat.

Sarah Teck, Middlebury College; Invasions Ecology, Dr. Greg Ruiz.

Julie Thien, B.S. in Biology, Truman State University; Terrestrial Animal Ecology, Dr. Pete Marra.

Bernd Unterkofler, Undergraduate Degree Equivalent, University of Vienna, Austria; CO_2 Lab, Dr. Bert Drake.

Branwen Williams, University of Guelph; Crab Lab, Drs. Tuck Hines and Paul Jivoff.

Tori Ziemann, B.S. in Chemistry, Beloit College; Nutrient Lab, Dr. Tom Jordan.

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Kim Sproat is SERC's Internship/ Fellowship Coordinator. For more information on Internships and Fellowships, contact Kim at 443-482-2217; e-mail: intern@serc.si.edu; web: www.serc.si.edu

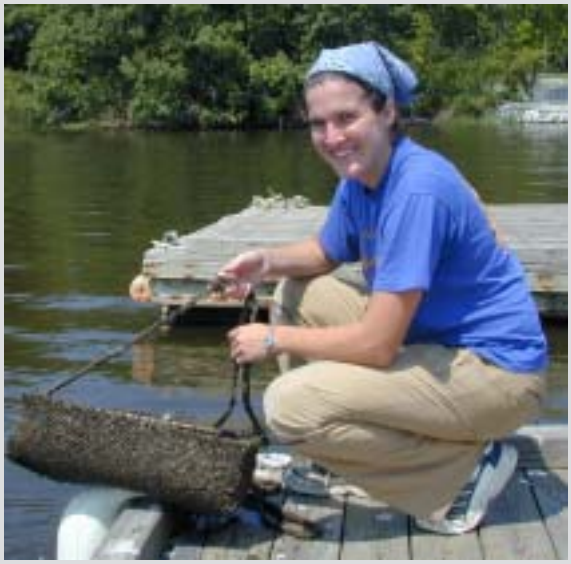
In their own words:

Joanna Smith

When I applied for this position the professor whose lab I work in at the University of Maryland College Park said what a great place SERC would be to get an internship because of the world-class research going on here. Of course, he's interested in research, and I'm thinking how I can avoid it. Well, I got the job, and he was right. It is an awesome place to work, but for me not so much because of the research.

I work in the education department, which seems at times almost like its own little world away from the labs and the rest of the business of SERC. I don't quite make it over to the volleyball court for games during lunch breaks, and until recently (when I joined the lab tours that were being given for interns from other Smithsonian bureaus) I had only a vague notion of what actually went on in the labs. As far away as we might seem though, we really are pretty close as it often falls to us to convey to the public in a meaningful way the information gained from the research that goes on here.

That may sound daunting, but I think my job is great. As I tell my friends and other interns here (as I gradually convince them education and not research is the way to go), my job consists of taking kids out on canoe trips, going seining and crabbing with them, and talking on and on about all the random things I know about the ecology of the area and the different animals and plants here. I think few people get as excited about seemingly random facts as I do especially when fish or aquatic ecology is involved, and I am always learning more and more while I am here from the staff, other interns, and the docents who come and lead activities.



Education intern Jo Smith working with an oyster basket for SERC's Estuary Chesapeake Program.

Playing with kids isn't the only thing I do. Like the other interns here I have a project to complete over the course of my internship. It revolves around Estuary Chesapeake, one of the programs we have for groups of students who come here.

The list of things to do for the program is varied and includes getting pictures of fish and organisms in the oyster bar community to help the kids identify them, designing new resource boards that provide the kids with the information for the station, making sure all of the equipment is in working order, and constructing new oyster baskets. So I'm playing with everything from mesh, cable ties, and polyurethane to digital cameras and Photoshop.

Of course there is also the big picture of the internship. It's a valuable learning experience for me to be able to work in environmental education (which is where I want to have a job after I'm finished with the whole college thing), gain practical skills, and become more familiar with the workforce and the opportunities out there—all those great reasons that college advisors tell you to get an internship.

That being said, what I think about is the fact that I'm having a lot of fun and working with some awesome people near the water, which is what I love.