A group of ESF’s most outstanding undergraduates left campus in the spring of 2012 and headed out to spend the summer working in ecosystems ranging from rivers to the pine bush and settings as diverse as a wolf park in Indiana and a museum in Moscow, all part of their participation in the ESF Honors Program.

On their honor

By Karen B. Moore, Claire B. Dunn and Dee Klees

The eight students were the first ESF students able to take advantage of internships offered by the Honors Program. The opportunity is a new one, supported by a gift from Douglas G. Dellmore WPE ’68 and his wife, Dana. The gift was made through ESF’s Centennial Campaign, the College’s first comprehensive capital campaign.

The Dellmores hope the new opportunities will increase student motivation to explore solid concepts and research before they graduate and enter the working world.

“It’s a focused way to try and assist students who are competitive and motivated to do the good things that are needed in the world,” Douglas Dellmore said when he attended ESF’s December Convocation to receive the ESF Alumni Association’s Lifetime Achievement Award.

The ESF Honors Program has two aspects: The Lower Division Honors Program provides first- and second-year students with experiences that engage them in unique challenges.

The Upper Division Honors Program provides opportunities for junior and senior students to complete intensive research and creative projects under the guidance of faculty.

Dr. William Shields, a biology professor who serves as director, said his vision for the program is to provide the richest academic experiences possible to ESF’s best students and help prepare them for life after college.

“Providing funding for the honors students to do this makes the internship experience a centerpiece for them to become passionate about the Honors Program and ESF. And by finding appropriate partners, we can use it as seed money to grow the program,” Shields said.

He described internships as a critical part of an experiential education, one of the hallmarks of the ESF student experience.

“This allows them to follow their hearts instead of just following the money,” Shields said. “This program challenges them. It is intended to make them apprentices to science, not just students of science.”

Shields expects the College to formalize its relationship with some of the institutions that host internships as the program develops. Prospective partners include businesses, governmental agencies and nongovernmental organizations.

The Dellmores’ financial support also enables ESF honors students to participate in national undergraduate research conferences to share the results of their work and network with their peers from institutions across the country.

“We are exceedingly grateful to the Dellmores for investing in our students this way,” Shields said. “Some of our most dedicated students now have opportunities they’ve never had before. This is an investment both in these deserving students and in the College as a whole.”

The honors students tell their stories...
Aya Yamamoto arrived at ESF interested in activism, eager to do some hands-on learning outdoors and ready to challenge herself academically.

It all came together last summer through her Honors Program internship with the Two Row Wampum Renewal Campaign, which will sponsor a voyage down the Hudson River to commemorate the 400th anniversary of the first treaty between the Haudenosaunee and European settlers.

“I love the idea of hands-on learning. That’s the reason I came to ESF,” said Yamamoto, an environmental biology major from Staten Island who attended high school in New York City’s Lower East Side. “But I definitely didn’t foresee that activity panning out on my home river.”

The campaign kicked off in Syracuse in February with an event called “Sharing the River of Life” at Syracuse Stage. The highlight of the campaign will be a 13-day trip down the Hudson River this summer with participants traveling side by side from Albany to New York City to depict the imagery symbolized by the Two Row Wampum: the two cultures traveling peacefully on their own journeys.

Through her internship, Yamamoto served as the logistical organizer for a four-day trial run in which she and other participants paddled canoes and kayaks from Saugerties to Bear Mountain State Park, a journey that translates to a 60-mile road trip. Yamamoto lined up camping accommodations, helped organize meals and met with supporters who came to meet the travelers during the four-day trip.

She received a stipend for the work she did this summer, and her internship is continuing on an unpaid basis through her senior year at ESF. She will work on the project until August. Her long-term goal is a career at the crux of indigenous and environmental issues.

“I didn’t foresee that the honors internship would give me a chance to do this sort of hands-on learning. I saw it as a chance to challenge my skills academically,” she said. “It’s just wonderful that it ended up giving me hands-on experience as well as a chance to learn applicable skills like being an organizer for an educational campaign like this. “This is one of the most enriching experiences of my college career. It’s given me really tangible skills in the fields that I see myself moving into.”
Dave Keiter, originally from Portland, Ore., and now a senior majoring in wildlife science, found his honors project took him across continents and beyond the Arctic Circle.

Keiter worked on a small-mammal study with a professor from the University of Alaska at Fairbanks and two biologists from the Russian Academy of Sciences. He traveled first to St. Petersburg, Russia, then to Moscow. At the zoological museum of Moscow University, he studied the collections of small mammals to learn what information could be gleaned from existing resources.

“It's interesting work,” he said, but challenging because the information at Moscow University wasn't digitized. The difference in technology was a bigger challenge than language.

“I tried to learn a little bit of Russian before I went,” Keiter said. He learned more of the language while he was traveling. “I picked up a lot about how to get around and enough for day-to-day use, but I’m nowhere near fluent.”

From Moscow, he journeyed across the Ural Mountains to Labytnangi in western Siberia to join a research expedition that trekked north and set up camp beyond the Arctic Circle. His field work involved the live trapping and observation of six species of voles and two species of lemmings as well as helping with the capture of mountain hare, ptarmigan and even a banded peregrine falcon.

While it was summer in the Arctic, there were challenges: “The mosquitoes were absolutely terrible,” Keiter said, even as he noted that they were a small part of the unforgettable experience. “There were one or two amazing camp dinners,” he said. “Everybody made food and sat and talked for hours.”

The honors project grew out of work Keiter did in the summer of 2011 while helping a doctoral candidate in Alaska. While there, he worked on some research of his own. A professor from the University of Alaska saw his side research and recognized that Keiter’s research abilities and small animal trapping experience would be valuable for the mammal survey. Keiter developed his study with the help of ESF Associate Professor Jacqueline Frair. He is analyzing the data he gathered from the Labytnangi small-mammal survey for a chapter in his honors thesis with hopes to have it published. Such population studies can provide clues about climate change, he noted.

### Counting Turtles Via Kayak

For most people, spending the summer kayaking on a river is an exercise in relaxation. For Amy Chianucci, a conservation biology graduate student, it was part of her research on northern map turtles on the Susquehanna River in New York’s Southern Tier.

Following up on a 2006 study of the turtle population by Dr. Victor Lamoureux from SUNY Broome Community College, Chianucci wanted to ascertain whether the turtle population had changed.

“Last year, the Southern Tier was hit really hard by Tropical Storm Lee and saw the highest floods ever recorded in the area,” she said. “Although turtles are adapted to flooded conditions, I figured that such a catastrophic event would have some sort of effect on the population.”

Because her trapping permit didn’t arrive from the DEC until the middle of the summer, Chianucci spent the first half of the summer conducting turtle surveys on the Susquehanna and Chenango rivers to determine the extent of the northern map turtle population. Using GPS and Google Earth, Chianucci mapped the turtles’ locations in the river. “Using these locations, I determined the best places to anchor the basking traps later in the summer,” she said.

Throughout the summer, she caught approximately 25 turtles. “We even recaptured a huge female from the 2007-2008 field season. It was exciting to see that the marks held up over the four years as well as seeing how much the turtles had grown over those four years,” she said.

Although Chianucci didn’t catch enough turtles to accurately determine a number for the present population, she used the field data from the 2007-08 season and calculated a population size of approximately 125 individuals. “However, by using corresponding dates between the two field seasons (2007-2008 and 2012), I found that on similar dates, similar numbers of turtles could be seen basking,” she said. “From this I concluded that the populations between the two years were probably very similar.”

Chianucci credits the honors program with giving her an opportunity she might not have had otherwise. “I was able to receive funding to conduct my research which I otherwise would not have. I gained valuable experience in the field in addition to learning how to conduct research independently. Additionally, the paper that I wrote in conclusion of this project helped me to further refine my professional writing skills.”
Karner blue butterfly populations have declined greatly due to human activities; Shelby Delgado spent her summer working to restore this endangered butterfly to New York.

Delgado, a senior wildlife science major, conducted research at the Albany Pine Bush Preserve where she helped raise Karner blues as part of the Albany captive breeding program and then released them back into the preserve.

The Karner blue is experiencing a decline primarily due to human activities such as agriculture, urbanization and fire suppression. “Although facing environmental challenges elsewhere, Karners in general are doing pretty well in the Albany pine bush,” said Delgado. “Because they are very host specific, in the early stages of life, habitat preservation is essential for species survival.”

Adult female Karner blue butterflies are captured from New York sites and immediately transported to a rearing facility in Concord, N.H. Eggs produced by these butterflies are raised to chrysalises and brought to the Albany Pine Bush Preserve. The adults that emerge are released into restored habitat to begin new colonies. According to the state Department of Environmental Conservation, in many cases these “new” colonies in fact represent the return of the iconic species to the very spots where it was once abundant.

Delgado was also able to devote some time to her honors thesis, looking at the genetic structure of prairie warblers, which involved banding the birds and taking blood samples weekly. But most of her time was devoted to the butterflies.

“A group of butterflies that I let go had a second brood a few meters from the release site,” she said. “That was really rewarding.” The butterflies aren’t tagged, but because they don’t move long distances from their birth site, researchers know the parts of a brood based on where they are located and the butterflies that were there before them, she said.

The hot summer of 2012 led to more than one brood of butterflies last year. “It was really neat and doesn’t happen often!” Delgado said.

Endangered Butterflies Nurtured in Preserve

Michelle Meyer has a lot of interests including working with children, writing and communication, and environmental issues. The more she pursued her various interests during her first three years at ESF, the more they combined to focus her attention on what became, in her view, an increasingly common thread: food.

“More and more, I kept coming back to food. Everybody eats. Everybody wants to eat three times a day,” she said. “People have lost the connection to where their food comes from. We think it comes from the grocery store. We’ve completely disassociated it from the environment.”

Meyer’s interest in food and her participation in ESF’s Honors Program led her to an internship last summer with Atlantic States Legal Foundation in Syracuse. She spent her time researching urban agriculture, learning about the mechanisms that make it work, the benefits of producing food in urban settings, restrictions and regulations, and land use challenges. She also visited urban agriculture sites in Pittsburgh and Chicago. Her experience culminated in a paper titled, “Urban Agriculture: A Capacity-building Strategy for the Revitalization of Vacant Land and Communities as a Whole,” that addressed such topics as the economic development potential of urban agriculture, the ecological implications and the human health aspect.

Meyer continues to do volunteer work with Atlantic States Legal Foundation through her final semester. Her goal is to work with children and educate them about growing food.

“You can get kids really interested in science just by growing food,” she said.

Meyer has participated in the Honors Program since she was a junior at ESF. “I wish I’d found the program earlier,” she said. “I was an orientation leader and I kept telling my small groups of freshmen and my mentees, ‘Join the Honors Program if you can. It’s awesome’.”

Everything Leads to Food
Wolf Pups Get a Helping Hand

Erin Moody spent the summer with a colony of wolves for her honors project. The senior from Poughkeepsie, N.Y., is majoring in conservation biology and had already completed her honors thesis with a research project on martens. She was looking for a new challenge when she learned about the possibility of an internship at Wolf Park in Battle Ground, Ind.

“I knew I wanted to work with predators, and wolves are probably the most persecuted predators in North America,” she said. Wolf Park is a conservation research park and home to a colony of wolves socialized to tolerate contact with the humans who study them and visitors who tour the park to learn about the species. The park was home to 14 adult wolves, six pups, two coyotes, two red fox and 10 bison when Moody was there.

Those six pups provided some of her most memorable moments, she said. In addition to teaching park visitors about the wolves, Moody’s responsibilities included an occasional daylong shift of tending the pups, watching them play and sleep.

“Sometimes I would be changing their water and picking out ticks and I would just have to sit back and think ‘Wow, I am helping to raise wolf puppies,’” she said.

Moody considers herself fortunate to find a rare internship working with predators thanks to encouragement from her adviser Professor William Shields and Associate Professor Jacqueline Frair. The support provided by the honors program allowed her to afford the summer in the unpaid internship. Moody said she intends to continue her studies in the field of human-carnivore conflict, which becomes increasingly important as growing populations of humans and predators such as coyotes and wolves come into contact in shared habitat.

Moody said she would advise any student interested in charismatic animal behavior projects to pursue the interest even if it seems tough to find a post in such a competitive field.

“They should go ahead and try. It could just work out like it did for me,” she said.

Internships Central to Education

ESF Provost Bruce Bongarten doesn’t understate the importance of internships in a college education: “If I had my way, everyone would do one.”

Internships are emerging as a major element of an ESF education, expanding beyond the Department of Paper and Bioprocess Engineering (PBE), where a professional experience has long been an integral part of the program.

The College has hired its first internship coordinator, Laura DeJoseph, who will focus on developing internship opportunities for students and supporting both faculty members and employers in making those opportunities available to students.

DeJoseph works with John Turbeville, ESF’s assistant dean for student affairs and director of career services.

“It’s very important to connect what students are learning in class with what happens in the so-called real world,” Bongarten said. “Some universities have every student do an internship or co-op. At ESF, it’s required of every PBE student. This reflects the influence the supporting industry has on the department.”

The numbers help tell the story: This spring, there were nearly 250 internships posted on GreenLink, an online employment and career resources site for ESF students and alumni. Half the 74 employers that attended the Environmental Career Fair in the Gateway Center in February reported that they were recruiting for internships. And in the 2011 survey of graduating students, 52.4 percent responded that they had participated in internships for academic credit. In the last academic year alone, 140 internships were completed for credit.

DeJoseph’s job is part of ESF’s effort to create an infrastructure that supports internships and gives the College a mechanism to ensure the experience is part of a student’s educational program, not just a summer or part-time job in the field. “We have to have oversight to make sure educational objectives are being met,” Bongarten said.

“Internships are the key to students gaining real-world experience that will help them be successful in their future fields,” DeJoseph said. “I look forward to connecting students with opportunities at top organizations to gain that experience. Through the support of scholarships, alumni and organizations in the field, our students are getting the kind of experience that can launch them in their careers.”
**Student Tallies Mussel Population**

The often overlooked population of tiny but potentially treacherous freshwater mussels in the Lake Ontario watershed is the focus of the honors project of Daniel Symonds, a conservation biology major from Rush, N.Y.

Freshwater mussels came into the public arena in the 1990s as surging populations of invasive zebra mussels clogged water pipes and hydropower intakes in the Great Lakes. North America is home to about 300 types of freshwater mussels, called unionids, and 30 of those are found in New York state, Symonds said. “Most of them are in streams,” he said. “Only a couple species can live in the deep water of lakes.”

Symonds, now a senior, developed his project out of his work with two biologists for the state Department of Environmental Conservation. They had a grant through The Nature Conservancy to take an inventory of unionid populations in streams flowing into the lake between Rochester and Oswego. Using U.S. Environmental Protection Agency protocols for quick assessments of water quality, they looked at the relative abundance of unionids in the streams. For his project, Symonds extended the work to look at the relative diversity of unionid populations in five streams. With the guidance of Associate Professor Kimberly Schulz, Symonds chose five streams that had previously been found to have either high levels of unionid diversity or low levels. He then looked for any correlation between mussel diversity and four water quality parameters.

Symonds is working with Schulz to analyze the data gathered during the summer and running water samples. So far no correlation has appeared in the data, Symonds said, “but no correlation is a result in itself.”

During the winter break, Symonds updated ESF’s unionid collection under the guidance of Assistant Professor Rebecca Rundell in preparation for putting the information online and making it more easily available to the research community.

**Cruise Focuses on Chemistry Research**

When John Richardson talks about his summer excursions, he’s not talking about pleasure cruises, but rather about working research cruises on the Delaware River aboard the RV Hugh Sharp. Richardson, a senior chemistry major from Glenville, N.Y., gathered data for his honors project on microbial oxidation of carbon monoxide into carbon dioxide as the craft traveled from Philadelphia to the mouth of the Delaware in 2012.

He developed the plan for the project after helping a doctoral candidate with lab work and being encouraged to turn his efforts into an honors project. Richardson’s examination of past research on the topic indicated there was a need for a study of microbial oxidation of CO in sunlight and he designed a research project to investigate it.

His project piggybacked on the riverine studies of ESF Associate Chair and Professor of Chemistry David Kieber and Professor of Marine Biosciences David Kirchman of the University of Delaware. They had grant support for their work aboard the research vessel but had no money for an undergraduate research assistant, Richardson said.

“I wouldn’t have been able to go without the money the honors program granted for housing and research materials,” he said.

They have completed two research cruises and plan two more. The work of executing his own research was an unforgettable experience, Richardson said.

“I had been on two research cruises before,” he said, “but this time it was different. I had the added responsibility of planning and the stress of making sure it all goes smoothly and that you have all the materials needed.”

Richardson said he was awaiting results of lab tests of samples to include in the analysis for his honors project. He hoped to present some results at a conference in New Orleans this winter.

Karen B. Moore and Claire B. Dunn work in the ESF Office of Communications.
Dee Klees is a freelance writer in Syracuse, New York.