Introduction:
The Ecological Society of America’s 8th Annual SEEDS Leadership Meeting was held in New Orleans, Louisiana from February 20-24, 2013. Over the span of five days, 31 passionate students from 23 institutions across the US came together at the beautiful Dillard University and the University of New Orleans to learn and lead discussions regarding environmental disasters, community outreach and social sciences and ethics. The theme of the Leadership Meeting was Ecological Recovery and Prevention of Environmental Disasters: Harnessing Science and Building Social Resilience.

Participants were impressed by how the people of New Orleans have been through and endured some of the most damaging environmental disasters in US history – Hurricane Katrina, Deep Horizon Oil Spill and large amounts of coastal land degradation. As an ecology program we realized the need to educate the next generation of ecologists on what to expect, how to understand fundamental issues underlying environmental disasters and how natural and social landscapes play a role in resilience and recovery. The overarching questions during the meeting shaped the program: 1) What can be done before, during and after a disaster from ecological and social points of view? 2) How can we be better prepared and informed? How can we as professionals in our field help our communities when they need it most?
I. Workshops, Field Trips and Movie Presentation

Day 1: Wednesday, February 20

The meeting began on Wednesday night with a meet-and-greet session with the students once they arrived at the University of New Orleans dorms. During this meet and greet, the students enjoyed a Cajun Catfish dinner, an introduction to the local flavors of New Orleans. Students introduced themselves, their institutions, shared their interests and their cultural backgrounds – 31 strangers became friends!

Day 2: Thursday, February 21

**Workshop 1: Understanding Environmental Disasters presented by Dr. Mike Blum, Tulane University.**

The workshop presented the different types of environmental disasters, the most recent ones in US history as well as other devastating disasters in the past. Students learned that there are two basic categories of disasters. The first type are environmental disasters caused by humans such as oil spills, wildfires, flooding due to damming waterways, land loss and deforestation, just to name a few. The second type is natural disasters; these are caused by random or cyclical events in the earth atmosphere due to weather such as hurricanes, tornados, floods, earthquakes and volcanoes.

Sometimes, as was the case with Katrina and New Orleans, both types of disasters are responsible for the damage. The workshop provided an overview on the science behind these phenomena and discussed the social and economic impacts as well.

**Workshop 2: Measuring the Ecological Impacts of Environmental Disasters presented by Dr. Lovell Agwaramgbo, Dillard University**

As a chemist, Dr. Agwaramgbo shared his experience and work on soil contamination in the bayous surrounding New Orleans and its communities. He presented evidence on the impacts that this had on community food gardens where the levels of lead and other harsh contaminants reached dangerously high levels due to frequent oil spills, flooding and much larger events such as Katrina.

Using an interactive approach, Dr. A, as students referred to him, split the group into smaller working groups and handed them different scenarios of environmental disasters. Students proposed steps on how to assess and collect the data to estimate the impact of such disasters, as well as communicating the science back to the impacted community. The group quickly realized that they all had proposed diverse and exceptional ideas on how to handle the situation. Students also realized that there is no easy way to assess the damage of these events.

**Field Trip 1: Assessing Catastrophic Disasters hosted by Dr. Peter Yaukey, University of New Orleans**

With all the new knowledge that students acquired in the morning and with a quick lunch, it was time to get out in the field. The group was greeted by Dr. Peter Yaukey, a well known ornithologist
Dr. Yaukey explained that after the destruction from Hurricane Katrina, there were a number of residential plots that were not rebuilt or redeveloped. As a result, open green areas in residential urban neighborhoods were “born”. These open areas were attractive to birds and other wildlife. Dr. Yaukey then walked the group through the methodology of defining the research area or transects, and the strict discipline of counting birds only if they entered the defined transects. He highlighted the importance of maintaining this discipline in scientific research. Scientists are not able to include birds sighted outside pre-defined transects even if they see a huge flock fly by. Students were exposed to the rigors of scientific research!

At one of the sites, we were greeted by a young bald eagle, perched upon the levy wall. Many in our group had never had the chance to see a bald eagle before so it was nice to be able to observe one at a fairly close distance.

Since our bird watching expedition was not quite as successful as we had hoped, Dr. Yaukey proposed that we might visit the bayous and see if we might spot some alligators – the bayous' top predator. We moved to Bayou Sauvage National Wildlife Refuge a few miles away from the city. Dr. Yaukey talked about invasive species of trees and grasses taking over the marsh after Hurricane Katrina and the challenges they are facing to recover the biodiversity in the area. We were unsuccessful in locating an alligator, but we did get to learn and see many other bird and reptile species.

Throughout the afternoon, as we were driving through many of the neighborhoods in eastern New Orleans, everyone was reminded of the tragedy and the impact that Katrina had on this community. Vacant lots that used to have houses, schools, hospitals and even major shopping malls have not been rebuilt 10 years after the storm. The surrounding wildlife was slowly recovering, but the scars of such a violent environmental disaster were still evident.

As we returned to Dillard University for dinner, Dr. Yaukey wanted students to see some of the impact that oil has had in New Orleans and took us to the Murphy Oil Spill site. This small community was destroyed by an oil spill during the hurricane. Giant oil containers from a Murphy refinery lifted from their foundations as the water level rose during Katrina's storm surge. This caused the containers to spill hundreds of thousands of gallons of crude oil into the homes and schools of this community. Tar is still visible on some of the homes; these are still vacant as most families never returned. This community had only seen the return of 33% of its residence in the last 10 years.

**Movie: My Louisiana Love – a video documentary by Monique Verdin**

Back at Dillard that evening, we were joined by Monique Verdin, a daughter of Mississippi River Deltas’ indigenous Houma nation. She holds a Bachelor’s degree in Mass Communications from Loyola University. Monique presented her first documentary “My Louisiana Love” –
http://www.mylouisianalove.com – in which she shared her life story when she moved away for a time and then returned to live with her Native American grandmother as her understanding of the environmental threats to her people was awakened. This growing awareness of the damaging cycles of environmental impacts inspired the production of this documentary. For generations, her family had lived in the bayou, enduring many disasters and always coming back to rebuild. The documentary is a very personal story of Monique’s views and it showed first-hand the devastation and chaos that was caused by Hurricane Katrina. It was quite a stirring experience to see and hear about the stories of residents and their purpose behind their faith and struggles for New Orleans.

The day ended as we returned to the dorms, still trying to comprehend the struggles that the people of New Orleans have faced but also with hope that the students in this group can make a difference for future generations and help our own communities.


**Workshop 3: Understanding the Human Dimensions of Environmental Disasters presented by Dr. Beverly Wright, Executive Director of the Deep South Center for Environmental Justice**

On Friday morning, students were greeted by Dr. Beverly Wright, founder of the Deep South Center for Environmental Justice (DSCEJ). The mission of the DSCEJ is to educate and develop leadership in areas of environmental, social and economic justice along the Mississippi River Chemical Corridor. They provide opportunities for communities, scientific researchers, and decision makers to collaborate on programs and projects that promote the rights of the people to be free from environmental harm and ensure a better quality of life.

Dr. Wright presented case studies and multiple examples about the impact that numerous environmental disasters have had on communities along the Louisiana coast and the Mississippi River Delta. She talked about her own experiences growing up in New Orleans and the impact that Hurricane Katrina had on the urban communities within New Orleans. We learned that funding priorities were not always fairly distributed to communities in need. Communities of color in particular, continue to struggle for funding to recover and rebuild 10 years after the disaster. Students learned about the challenges these impoverished communities continued to face with only 1/3 of the residents who have returned home after Katrina.
Workshop 4: Engaging Local Communities presented by Dr. Shirley Laska and Staff from the Center for Hazards Assessment, Response and Technology at the University of New Orleans (UNO-CHART)

Continuing with the theme of social impact and community interactions, Dr. Laska, who has over 25 years of experience of applied research on social/environmental hazards and disaster response, brought a panel of employees from UNO-CHART to talk to students. The panel shared with students how to correspond and engage the local communities after an environmental disaster and the many challenges researchers face when entering these close knit communities for the first time.

Undergraduate interns from UNO-CHART talked to students about their life experiences after Katrina and the research that they have conducted since then, especially after the BP Oil Spill. One of the interns shared her experience working with a fishing town affected by the oil spill, the same town she grew up in. These personal stories touched everyone during the workshop; they realized that how hard it is to recover from these disasters and the undeniable resilience of these communities.

Field Trip 2 Community Engagement: Visit to the Lower Ninth Ward

Led by Darryl Malek, Environmental Justice coordinator with Sierra Club, students were welcomed to the Lower Ninth Ward at the Holy Cross Neighborhood Church. The church association, along with the Sierra Club has been at the forefront of the recovery efforts for this community. The Lower Ninth Ward was the area of New Orleans that suffered the greatest number of human casualties due to Hurricane Katrina. It’s hard to describe the emotions that the group felt when they were there. Seven and a half years have passed since the Hurricane and only about 40% of the original residents returned to their community. Many of the homes have been demolished and all that can be seen is an empty lot. Where the frame of the house is standing, the door still bears the graffiti from the search and rescue crews (a giant X with codes for; time and date of search, hazards present, number of live and dead victims found and rescue team identifier).

The group quickly realized that the residents of the Lower Ninth Ward have been through a lot and still have a long ways to go. Families that survived could not retrieve what little they had left for over 6 months after the storm. Many of the stores, schools, health clinics and gas stations, regular amenities for most urban communities, have remained closed and will not be available to them in the near future. The water marks on the church’s walls were never repainted as a reminder of what had happened.
After a quick tour of the levy and the houses that were destroyed, the group was taken to the new “recovered” side of the Ward. Thanks to many non-profit organizations and celebrity donations, a few of the residents that returned have been able to apply for new houses that are being built. These homes sit at a higher level and offer a more sustainable lifestyle for these families. We were able to talk to residents in this area and were surprised by their stories. The amazing thing about the people of New Orleans is that no matter what they’ve been through, they exude an unsurpassed happiness for life and it’s evident that they have learned to enjoy the little things, which many of us don’t appreciate.

**Day 4: Saturday, February 22, 2013.**

**Workshop 5: Scientific Ethics**

A workshop on Scientific Ethics was offered at the SEEDS Leadership Meeting for the first time so that students might understand the framework for right conduct in science. Dr. Scott Collins, University of Mexico, ESA President led the workshop. Students were provided with four case studies presenting scenarios of various dilemmas. In small groups, students discussed the viewpoints in the case studies and their personal responses.

**Workshop 6: ESA and SEEDS**

Through evaluations of previous Leadership Meetings and other SEEDS program, we have realized that often, students do not have a good idea of what a professional scientific society is about and sometimes, are not clear about all that SEEDS offers. Led by SEEDS staff, Fred Abbott and Teresa Mourad, this session engaged students in the role and benefits of professional societies. We emphasized the importance of a professional home and family and the enormous networking benefits of belonging to the society. As participants of the Leadership Meeting, SEEDS provides each student a free one-year membership.

**II. Career Panel and Evening Reception with ESA members**

A Career panel was convened with the following:
- Tracy Austin, Mitsubishi Corporation Foundation for the Americas
- Dr. Scott Collins, ESA President, Professor of Biology, University of New Mexico
- Dr. Jacoby Carter, Research Ecologist, USGS
- Dr. Nancy Grimm, Arizona State University
- Sylvia Staples, undergraduate student, Ambassador of the US Forest Service internship program

The panel began with brief opening remarks by each of the panelists and then responded to questions from students.

Following the Career Panel, we moved to our first Evening Reception with ESA members from the area. Twenty-two (22) members from New Orleans were invited and eight accepted our invitation. The ESA members were a mix of
academic and agency ecologists. The event opened with a welcome by Teresa Mourad, ESA Director of Education and Diversity Programs, and Scott Collins, ESA President. We then had SEEDS student, Adrienne Hampton, Washington State University, speak about her experiences in SEEDS. She highlighted that SEEDS allowed her to grow in ecology and to network with others who share her passion for the life sciences. The event was an opportunity for ESA members to interact with our students and for our students to learn more about the field of ecology. It was a tremendous success as students and scientists lingered to talk to one another long past it was time to leave.

III. Research Project Presentations by SEEDS Undergraduate Research Fellows
Over Thursday and Friday, the 2012-2013 SEEDS Undergraduate Research Fellows presented the findings of their research they had conducted over the summer of 2012. This allowed the Research Fellows to rehearse their scientific presentations that will be made at the 2013 ESA Meeting and the SEEDS Leaders to see and hear their own peers as scientists. The presentations were:

Carlos Zayas Santiago
Research Project: *Comparison of functional anatomy in squid and local hydrographic and biological pressures from two different habitats; Hawaii Shtenotuthis oualaniensis, Monterey Bay Doryteuthis opalescens.*
Dr. William Gilly, Stanford University
Research Site: Stanford University Hopkins Marine Station

Vincent Waquiu
Research Project: *The impact of co-occurring herbivores on foliar chemistry and microbial abundance*
Mentor: Dr. David Orwig, Harvard University
Research Site: Krause Farm in Rhode Island, Latitudinal gradient from southern Connecticut to Massachusetts, Harvard Forest

Dayani Pieri
Research Project: *The effects of perennial grasses grown in interspecific and intraspecific combinations on the growth of their arbuscular mycorrhizal symbionts*
Mentor: Dr. R. Michael Miller, Argonne National Laboratory
Research Site: United States Department of Energy's Fermilab National Environmental Park in Batavia, Illinois

Tiffany Carey
Research Project: *Developing estimators of ragweed pollen production from measurements of inflorescence size*
Mentor, Dr. Kristina Stinson, Harvard University
Research Site: Harvard Forest

IV. Breakout Groups
On Saturday February 23 students were divided into four break out groups to discuss action steps and recommendations in Ethics, Education, Community Engagement and Science.
**Group 1 Ethics**
The group recommended exposure to research ethics early in their careers. They felt that it is their job as scientists to overcome superstition and fear and to maintain truth and integrity. The group proposed a certification course for undergraduate students to learn about ethics. Topics would include how to treat research subjects, quality control, case studies, understand chain of command of communication (whose research belongs to whom), participatory action and serving the community.

The group suggested that resources such as videos be provided that show a scenario, a forum for asking questions, quizzes as well as space for sharing personal stories, funny stories, and testimonies on how to create a sense of community. They proposed that the course be open to the SEEDS community first.

**Group 2 Education**
The group felt strongly that education around community should begin at a very early age, beginning at preschool. Emergency preparedness programs should be enhanced in our schools. They proposed that students be engaged in community gardens to build a sense of resilience. They also proposed that ecology be part of K12 teacher preparation so that undergrad students can become highly qualified ecology teachers. They recommended that a program focused on Teaching modeled after the current SEEDS program be introduced, including both science and non science majors interested in teaching.

The group also suggested that an "As an Ecologist" website be created so that students and teachers can receive an expert answer on their questions.

For undergraduate students, the group proposed that more emphasis be placed on data literacy in order to understand and predict the magnitude of environmental disasters. They would also like to see more collaborations between chapters in order to disseminate tips related to ecology on the local level.

**Group 3 Community Engagement**
The group proposed that studies be facilitated through interaction and dialog with community leaders to identify and address a situation. They understood that it was important to develop a common language in the process of formulating questions as well as what information and data is important. They urged that scientists learn from the community, that goals should arise from the
community, that community issues should be respectfully incorporated and that care be taken against imposing our own values on the community.

The group expressed concern that the current practice of science may not be as sensitive to community's interests as it can be. The group felt that it was critical to make science more personal so that communities can benefit from scientific studies. Students suggested that science be synthesized into a personal narrative that can relate to people rather than simply graphs and data sheets. They also wish to see the scientific community engage other disciplines and dimensions such as the cultural history of the community. This will help bridge the gap between science and community.

**Group 4 Science**
The group recognized that there was a scarcity of research on preventing or predicting environmental disasters. They proposed that a web-based tool be developed for each SEEDS chapter to collect data on natural resources in their area which can then be compared when disasters strike.