

2019 Pioneer Showcase Schedule
Mollohan Campus Community Center
April 25, 2019

8:00 am – 10:00 am	Poster and Artwork Display set-up	MCCC Ballroom
10:00 am – 5:00 pm	Poster and Artwork Display	MCCC Ballroom
10:00 am – 11:30 am	Poster Session I	MCCC Ballroom
11:00 am - 12:00 pm	Oral Session I	MCCC 315
1:00 pm - 2:30 pm	Oral Session II	MCCC 315
2:00 pm – 3:30 pm	Poster Session I	MCCC Ballroom
3:30 pm - 4:30 pm	Bluegrass Band	MCCC Ballroom
4:30 pm	Awards Ceremony	MCCC Ballroom

Oral Session I: 11:00 am – 12:00 pm
Rm 315

11:00 – 11:15 am	T1	Jessica Beckett	Placement Rate of Criminal Justice Alumni from Glenville State College
11:15 – 11:30 am	T2	Jeraiah Cayton & Zavier Busby	Raptor Phone Repair Plus
11:30 – 11:45 am	T3	Hannah Dennis	Ekphrasis: The Links Between Mediums
11:45-12:00 pm	T4	Matthew Hackworth	West Virginia Opioid Epidemic

Oral Session II: 1:00 – 2:30 pm
Rm 315

1:00 – 1:30 pm	T5	Alona C. Linatoc	Ecophysiological trade-off of land-use change from forest to monocrop plantation: Impacts of volatile organic compounds in atmospheric chemistry, a case study in South East Asia
1:30 – 1:45 pm	T6	Ally Brown and Sara Sawyer	Investigating The Role of Increased Temperature On the Extracellular Matrix Related Proteins of <i>Aiptasia pallida</i>
1:45 – 2:00 pm	T7	Chere Davis and Jeremy Keene	Evolutionary Analysis of <i>Monopyle</i> (Gesneriaceae) from Panama
2:00 – 2:15 pm	T8	Colton Ring and Jeremy Keene	Confirmation of the New Genus <i>Pseudodiastema</i>
2:15 – 2:30 pm	T9	Scott Wentz and Jeremy Keene	Towards a Revision of <i>Diastema</i> within Central America

Poster Session

10:00-11:30 am and 2:00-3:30 pm

Authors with odd numbered posters will be by their poster from 10:00-11:30 am

Authors with even numbered posters will be by their poster from 2:00-3:30 pm

P-1	Carissa Yoak, Holly Wilson, Abby McCarty	Encouraging Young Children's Curiosity through Exploration and Discovery Activities
P-2	Mazie C. Elliott	The Mystics
P-3	Erica Jones, Mary Stoops, Myka Perry, Alexis Spell	Unit Project
P-4	Logan Saho	Costume Design: Doctor Faustus By: Don Nigro
P-5	Haley Cottrill, Cali Hayes, Cheyenna Henderson, Faith Norris, John O'Hara, John, Tobi Short, Karra Smith, McKenzie Yanero	The transportable Black History display for K-6
P-6	Justin Woods and Sara Sawyer	Characterization of Integrin Distribution and Function in the Symbiotic Sea Anemone, <i>Aiptasia pallida</i>
P-7	Jessy Moore and Dr. Jong-Hoon Yu	Promoting Physical Activity in Children with Disabilities
P-8	Autumn Jones and Kevin L Evans	Grignard reagents, mechanisms and reactions
P-9	Logan Hosaflook, Abigail Johnson, Nicole Hall	WhiteTail Deer Management across West Virginia
P-10	Mayme Layfield, Quincy Band, Cody Mullens, Allyson Degrassi	Effects of Cigarette Butts on <i>Brassica rapa</i>
P-11	Braxton Rider & Holly Tucker	American Black Bear Management Practice
P-12	Matthew Rao, Caleb Bennett, Dalton Dean, Allyson Degrassi	Particulate Matter and its effects on <i>Brassica rapa</i> .
P-13	Daniel Hedges Marisa Shannon	Eastern Coyote
P-14	Tessa Jordan, Mason Thomas, Allyson Degrassi	Cold Temperature Effects on <i>Brassic rapa</i>
P-15	Ethan Dawson, Cora Hedrick	The American Red Squirrel (<i>Tamiasciurus hudsonicus</i>)

Authors with odd numbered posters will be by their poster from 10:00-11:30 am
Authors with even numbered posters will be by their poster from 2:00-3:30 pm

P-16	Jacob McLaughlin, Kurt Bokesch, Henry Slaughter, Allyson Degrassi	The Effects of Saltwater on Brassica rapa
P-17	Coleden R. Belknap, Kevin L. Evans	Legal LSD: Increasing the Realness of Mock Crime Scenes
P-18	Preston M. Allison and Sara Sawyer	Investigating the Impact of Temperature on the Mesoglea of the Sea Anemone Exaiptasia pallida
P-19	Mitchell Queen and Rico Gazal	North Carolina Logging and Logistics
P-20	Tyler Moore and Jeremy Keene	Evaluation of the Diversity within Diastema
P-21	Holly Tucker and Rico Gazal	Forestry in Florida
P-22	Bethany Mote and Jeremy Keene	Description of two previously unknown species from Panama
P-23	Ethan Dawson and Rico Gazal	Forestry in Russia
P-24	Emily Stoller, Jenae Shar, and Sara Sawyer	Determining the Presence of Wolbachia in Different Species of Insects and Other Arthropods
P-25	Anthony Murdock and Rico Gazal	Tennessee forest management
P-26	Devon Harris, Josiah Nuse, Allyson Degrassi	How Brassica Rappa Grows in Sand with and without nutrients.
P-27	Abigail Johnson and Rico Gazal	Forest Management in Oregon
P-28	Daniel Cameron and David O'Dell	Temporal variability in extractable manganese concentrations in air-dry and field-moist soil
P-29	Quincy Band and Rico Gazal	Landscape Disturbance Index of West Virginia
P-30	Derek Waugh and Jeremy Keene	Understanding species diversity within the genus <i>Pseudodiastema</i>
P-31	Jonathon Shreve and Rico Gazal	The practice of forest management in coalition with the NWTf

Oral Presentations Project Descriptions

T-1 Jessica Beckett

Placement Rate of Criminal Justice Alumni from Glenville State College

This presentation encapsulates the job placement rate of Glenville State College (GSC) criminal justice alumni. The presentation will convey potential factors that influenced graduation and placement rates of GSC college students. Internships are a positive experience helping graduates find employment after graduation. In order to gather the data a survey was sent to all qualified criminal justice alumni. Participants were derived from 270 GSC criminal justice alumni who graduated within the last five years (2012-2018 school years). They graduated with an associate, bachelor's or minor in criminal justice. Of the 270 alumni 26 (9.6%) responded to a survey capturing nine variables. The collected data was first calculated for percentages and then a chi-square test was performed to identify any potential significance between the nominal variables. Of those 26 alumni that responded 3 graduated between 2012-2013 (11.5%), 22 graduated between 2014-2018 (84.6%) and one that did not indicate what year (3.9%). There was 10 (38.9%) who graduated in the fall, 14 (53.9%) in spring, and 2 (7.7%) in the summer term. After graduation 7 (27%) indicated they did not get a job within the criminal justice while 19 (73%) indicated they had. In less than 3 months (46.2%) indicated they had received a job, 4 (15.4%) received a job between 3-6 months, 2 (7.7%) in 6 months to a year and 7 (26.9%) took more than a year, and 1 (3.9%) alumni who did not indicate a time frame. A full chart of all variables will be presented later. The variables that showed significance in the chi-square test are the graduation date and degree required, term and job acquisition, criminal justice job and working in the criminal justice field, and criminal justice job and if not will you in the future.

T-2 Jeraiah Cayton & Zavier Busby

Raptor Phone Repair Plus

The development of a business model for Raptor, a cell phone repair, and enhancement company, offering unique and innovative ways to enhance the means by which consumers interact with their cell phones. Through the creation of distinctive technology products, Raptor will customize a consumer's phone to provide a seamless integration with their everyday life. Also, Raptor will provide standard services such as phone repair, upgrades, and accessories that will enrich the consumer's relationship with their phone. With over 224 million cell-phones in the United States, Raptor has a large market with which it can provide its unique services. The business model highlights each of the areas in which Raptor will reach its target market and provides the details on Raptor's unique products and enhancements that provide that market with the seamless mobile and life integrations its customers will come to expect from Raptor.

T-3 Hannah Dennis

Ekphrasis: The Links Between Mediums

This is a paper presentation concerning ekphrasis and how using both art and poetry can stimulate the brain and therefore boost creativity.

T-4 Matthew Hackworth
West Virginia Opioid Epidemic

I completed a research project for the Glenville Honors College. In my project I compared the national opioid epidemic and compared it to the West Virginia crises. I looked not only at the overdose deaths, but reached out to local law enforcement to compare their opioid arrests, deaths, and opioid seizures to the national average.

T-5 Alona C. Linatoc
Ecophysiological trade-off of land-use change from forest to monocrop plantation: Impacts of volatile organic compounds in atmospheric chemistry, a case study in South East Asia
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Tropical rainforests cover merely 7% of the world's total land area; however, host more than 50% of the world's known biological diversity. Tropical rainforests are also recognized in providing ecological services including provisioning, supporting, regulating and cultural - roles that support the existence of humankind. However, due to the worldwide increase in population, conversion of forests to various land uses has been inevitable. Vast areas of tropical rainforests in Southeast Asia have been logged primarily to meet the demands of timber and other forest-products. Majority of forests that have been logged (deforested) has not been reforested, but is converted into agricultural farms (monocrop plantations), residential, as well as other development areas. This paper aims to present the trade-offs of land-use change from forest to monocrop plantations (i.e. oil palm) in terms of ecophysiological properties through the emission of biogenic volatile organic compounds (BOVCs). Canopy and ground emissions of BVOCs from forests and oil palm plantations were quantified and compared. Results show that biogenic volatile compounds emissions from oil palms are hundred-folds over than that of tropical trees and are significantly altering the atmospheric chemistry in the Southeast Asian tropical region.

T-6 Ally Brown & Sara Sawyer
Investigating The Role of Increased Temperature On the Extracellular Matrix Related Proteins of *Aiptasia pallida*

Reef-forming corals form a mutualistic symbiosis with dinoflagellate algae and it is this symbiosis that provides the corals with the nutrients needed to form massive reefs. Corals are subjected to an increasing array of environmental stresses and under stress corals can lose their symbiotic algae, or bleach. Increased water temperature is the leading cause of coral bleaching and this temperature change induces oxidative stress and likely leads to programmed cell death (apoptosis). Previous research has suggested that temperature affects the expression of genes for extracellular matrix proteins, for example collagen and the matrix metalloproteinases (which remodel the extracellular matrix) in the symbiotic tropical sea anemone *Aiptasia pallida*. Alterations in expression of this group of genes could affect cell survival and/or cell death pathways. In this study we are investigating how temperature affects the expression of multiple genes involved in regulating the extracellular matrix in the sea anemone *A. pallida*. To date we have identified two different control genes, RPL11 and GPD1 that work well in our system. We are currently testing primers against MMP 9, MMP 14, MMP 17, Zn-MP 4, Zn-MP 6, and Zn-MP 7 genes

to determine how well they will work in qPCR. We have previously tested primers against D-MP 7, D-MP 23, Zn-MP 4, Zn-MP 13, Zn-MP 15 genes that did not work well in qPCR however results from ZnMP 4 did show its expression decline with increased temperature and we are testing a new primer for this gene. These matrix genes are of interest because we are trying to determine the underlying mechanisms and reasoning behind the remodeling of the extracellular matrix during temperature-induced bleaching.

T-7 Chere Davis and Dr. Jeremy Keene Evolutionary Analysis of *Monopyle* (Gesneriaceae) from Panama

Monopyle Moritz ex Benth. (Gloxiniinae: Gesneriaceae) is a group of terrestrial understory or facultative epiphytic herbs distributed from Guatemala southward through northern South America. *Monopyle* is traditionally characterized by differentially swollen internodes, anisophyllous opposite leaves, campanulate flowers, osmophore and the presence of uncinata trichomes (Keene, 2013; Roalson et al. 2005; Weber, 2004). *Monopyle Moritz ex Benth.* is currently represented by six species and one variety in Central America. The largest percentage of taxa have been confirmed to reside from the premontane to montane forest in Panama and Costa Rica from 300–1300 m. *Monopyle puberula* C.V. Morton and *Monopyle maxonii* C.V. Morton have the broadest distribution in the region with other species being narrow endemics. Revisionary work on the genus has led to the identification of several newly discovered species in the region previously lumped within *Monopyle macrocarpa* Benth. A morphological and molecular assessment of species from this region have shown that *Monopyle macrocarpa* does not occur in Central America and is actually restricted to an area of Northern Peru. The newly discovered species can be determined by a suite of characters which include density of pubescence, petiole length, calyx shape, and corolla shape coupled with color. My research focuses on separating both *Monopyle dichotoma* Keene ined. and *Monopyle sessilis* Keene ined. as new species from previously known taxa.

T-8 Colton Ring and Jeremy Keene Confirmation of the New Genus *Pseudodiastema*

Pseudodiastema is a genus of plants within the subtribe Gloxiniinae (Gesneriaceae). Some of the characteristics of *Pseudodiastema* are decumbent herbs, leaf-like bracts, reduced inflorescence. I am currently collecting morphological and molecular data to complete field studies of the genus *Pseudodiastema*. Morphological studies will focus on taxonomically useful vegetative and reproductive characteristics. Field work will be carried out in northern Panama. I will be observing the ecology and population structure of the local species. Field studies will provide an opportunity to obtain data that is not easily observed on herbarium specimens. The outcomes of this research will provide a baseline for conservation and governmental agencies to work from to protect the habitat where these species exist. Evolutionary studies will be completed following the field study to ascertain the relationships between the species present. My research will be a more comprehensive study of the subtribe and genus.

T-9 Scott Wentz and Jeremy Keene
Towards a Revision of *Diastema* within Central America

Diastema is a genus of flowering plants within the subtribe Gloxiniinae (Gesneriaceae). Some key characteristics of *Diastema* include a racemose flowering axis consisting of solitary flowers in the axils of bracts on the stems with condensed internodes, nectary consisting of 5 finger-like glands, and a distinctive bi-lobed stigma. Interestingly, there are currently only twenty described species and *Diastema* has not been the focus of adequate research until now. I have collected a sufficient sample size of morphological and molecular data from both known and unknown species. Any new potential new species are compared to the appropriate type specimens to determine circumscription. Moreover, morphological studies focus on taxonomically useful vegetative and reproductive characters with special emphasis given to trichome structure and fruit shape. Molecular studies are focused on nuclear and chloroplast genes to ascertain if any hybridization has occurred. Several samples of DNA are now ready to be sequenced for a more comprehensive understanding of the genus. The outcomes of this research will provide a baseline for conservation and governmental agencies to work from to protect the habitat where these species exist and to better understand the biodiversity in their area. My research is used toward a more comprehensive study of the subtribe and genus.

Poster Presentations Project Descriptions

P-1 Carissa Yoak, Holly Wilson, Abby McCarty Encouraging Young Children's Curiosity through Exploration and Discovery Activities

In this poster project presentation titled, Encouraging Young Children's Curiosity through Exploration and Discovery Activities, the Glenville State College Early Education Student Group will highlight a variety of hands on learning activities to enhance and encourage young children's curiosity through activities in exploration and discovery. Connections to children's literature will also be highlighted. The presenters will focus on activities for connecting children's literature to activities that build curiosity. Activities for families to build exploration and discovery will also be included. Activities will be developmentally appropriate for preschool and kindergarten aged children. Hands on activities to encourage exploration and discovery, as well as connections to STEM and STEAM will be included. This poster project is based on a workshop presentation given by the GSC Early Education Student Group at the recent Southern Early Childhood Association Annual Conference in Orlando, FL.

P-2 Mazie C. Elliott The Mystics

Chalk pastel art piece on paper card board for mix media.

P-3 Erica Jones, Mary Stoops, Myka Perry, Alexis Spell Unit Project

Our group chose different grade levels to complete two week long or longer units based on the subject science. We found 1-2 CSOs for our chosen grade levels and put together lesson plans, activities, and included examples of every activity. Other items included are safety and curriculum maps.

P-4 Logan Saho Costume Design: Doctor Faustus By: Don Nigro

The project that I will be presenting at the Pioneer Showcase is my costume designs from the play Doctor Faustus written by Don Nigro. The project is a series of four different hand drawn and hand painted pieces with water color paint. The method of design is to show take what has already been written in the script and bring it to life as a costume, if the play script does not have a description of the costume one must research what someone would wear in the time the play is set. For example Warner did not come with any specific clothing or attire described at all. It was then up to me research and find what a servant would wear in the 1620s. The best place to research clothing is the internet, but from there I went and looked at paintings done within the time. The four costumes will be from the four characters within the play, Faustus, Mephistopheles, Warner, and Helen of Troy. Faustus' costume is a plague doctors robes, Mephistopheles' costume is a red unholy monk's habit, Warner is wearing the traditional male clothing of the 17th century, and Helen of Troy is wearing a chiton from ancient Greece.

P-5 Haley Cottrill, Cali Hayes, Cheyenna Henderson, Faith Norris, John O'Hara, John, Tobi Short, Karra Smith, McKenze
The transportable Black History display for K-6

SCNC 205 students created a transportable black history display that can be borrowed by local K-6 teachers to teach black history month. The mobile displays include developed K-6 lesson plans for the appropriate grade levels. Local county school systems will be contacted and will be able to borrow the displays for their schools during the upcoming year.

P-6 Justin Woods and Sara Sawyer
Characterization of Integrin Distribution and Function in the Symbiotic Sea Anemone, *Aiptasia pallida*

Integrins are transmembrane receptors that connect cells to the extracellular matrix. Integrins consist of two subunits an alpha and a beta that work together to bind to the extracellular matrix and control intracellular signaling. They are found in all animals and more basal animals like Cnidarians have few integrins compared to more derived animals like mammals. The integrins of a non-symbiotic sea anemone have been fully characterized and this anemone has 2 Alpha and 4 Beta subunits. Our goal is to characterize the integrins in the tropical, symbiotic sea anemone, *Aiptasia pallida* and then to investigate their function during regeneration, wound healing and temperature-induced bleaching. To do so, we have designed primers to known integrin genes to determine which integrins are expressed in a healthy anemone, during regeneration, wound healing, and bleaching. To date, we have analyzed primers against the following control genes GAPDH, RPL11, Actin, NDH5, and GPD1 as well primers against integrin genes Alpha 4, Alpha 6, Alpha 8, Alpha 9, and Beta 6. To test the primers, we first determined if they amplified the gene during regular PCR. If that was successful, we next performed a serial dilution to test amplification efficiency. None of the initial set of primers against different integrin genes worked well enough to continue to qPCR. The primer against the control gene RPL11 was determined to work well. We are now testing new primers against the following integrin genes, Alpha 2, Alpha 5, Alpha 7, Beta 1, and Beta 3. Amplification and serial dilution primer specificity testing on these primers will determine if these primers are functional enough to use in future experiments.

P-7 Jessy Moore and Dr. Jong-Hoon Yu
Promoting Physical Activity in Children with Disabilities

This presentation will discuss participation of children with disabilities in sports recreation and physical activities. Physical activity is vital for people of all ages, but even more so for children. There are many benefits of physical activity for students with disabilities. Despite this, children with disabilities are more restricted in their participation in physical activity. This leads to not only the absence of the benefits, but numerous health risks as well. Doctors, parents and educators must work together to develop appropriate physical activity plans for children with disabilities. Children who participate in physical activity are rewarded with enhanced overall well-being. Physical benefits minimized deconditioning, optimized physical functioning, higher skill and competency levels, and improved mobility. Psychological benefits include higher self-esteem, creativity, peer acceptance, social skills, satisfaction, support, and much more. Physical risks of being inactive include obesity, reduced cardiovascular health, osteoporosis, impaired circulation and low mobility. There are many more risks associated with these risks. In addition, physical inactivity will result in less social acceptance, lower self-esteem, and will lead to greater dependence on others for daily living. 18% of children have a chronic condition or disability. Despite

the benefits and the risks; there are far fewer opportunities for participation among this group. Children with disabilities are more likely to be sedentary, are less fit, and have higher levels of obesity than their peers without disabilities. This gap only widens as they grow older, but participation as a child reverses all of these negative facts increases the likelihood of life-long fitness.

There are many barriers of participation, but they are not insurmountable. There are even laws which mandate physical education to students with disabilities. Because each disability is unique, there will be different goals and considerations for each. One fact remains no matter the obstacles – all children need physical activity.

P-8 Autumn Jones and Kevin L Evans Grignard reagents, mechanisms and reactions

The Grignard reaction is traditionally an organometallic reaction that adds an alkyl, vinyl, or aryl magnesium halides to the carbonyl carbon in an aldehyde or ketone. Grignard reactions with aldehyde or ketones yield alcohols. In my research, we are looking at modifying the typical Grignard reaction with a ketone to include the carboxyl carbon an ester and a carboxylic acid yielding an alcohol or a ketone. This research is important for understanding the mechanisms that occur during the reactions, and explain how the how two functional group of the reactant effect the outcome of the reaction performed under the same conditions. Applications of this can then be applied to organic classes in the future.

P-9 Logan Hosaflook, Abigail Johnson, Nicole Hall WhiteTail Deer Management across West Virginia

Introduction: This goal of this research project is to better understand whitetail deer across the state of West Virginia. West Virginia holds multiple types of terrain and ecosystems, which will affect the ways Whitetail deer live.

Purpose: Factors like disease, food types, forest cover, urbanization and the natural resources industry, can affect the way deer live across the state. Different types of studies and maps can be made to help judge deer herd numbers and what they are experiencing in their habitats. It is important to understand the different habitat types across the state where deer live, so we as researchers are better able to understand deer herd numbers and how their numbers vary across the state. Along with population numbers, disease and over grazing can be measured by the data collected.

Methods: There is a number of ways that Whitetail populations can be measured, along with the other factors that follow them. Harvest records, GIS mapping, wildlife reports, disease reports, and numerous other pieces of scientific data, will be used to help gather information on the species and the habitat in which they live. The data will be reviewed to make sure there is no bias information and that the data recorded is up to par to be used for the study.

Results: The results will vary across the state from disease, habitat, population numbers, and numerous other areas. As mentioned before the state of West Virginia holds many different ecosystem types, which can affect Whitetail deer all across the state. The results will help researchers better understand deer numbers and all the factors that follow them, helping our state be better adapted to deer numbers and their ecological requirements.

P-10 Mayme Layfield, Quincy Band, Cody Mullens, Dr. Allyson Degrassi
Effects of Cigarette Butts on *Brassica rapa*

Pollution is a major issue throughout the world and continues to grow every day. When people interpret the effects of pollution, they normally relate it to air pollution. Often pollution is seen in the form of litter. There is little known about the effects of used cigarette butts on soil quality and plant life. We hypothesize that the presence of cigarette butts will affect the growth and reproductive structures of *Brassica rapa*. We planted 48 *B. rapa* plants, 24 with cigarette butts and 24 controls. Each cell contains one *B. rapa* seed, planted $\frac{3}{4}$ inches deep into the soil and then loosely covered with soil. Treatments of one used Marlboro cigarette butt was placed at the top of each cell uncovered to simulate a cigarette butt that was littered. Our null hypothesis is that cigarette butts will have no effect on the growth and reproduction. Although, our data did not support our hypothesis, we did discover needed information about the effects of cigarette butts on vegetation. We found that *B. rapa* grew with cigarette butts but by the end of the experiment they died off while the control continued to flourish.

P-11 Braxton Rider & Holly Tucker
American Black Bear Management Practice

For this project my partner and I have chosen the American Black Bear. We chose this animal because we figured it would be easy to obtain a lot of information about such a popular large creature. Our goal for the management plan is going to be to keep the population the same rather than increasing or decreasing it. We believe they are very important to the state for tourism as well as being hunted for sport. It will be difficult I believe just because you can't limit their food source very much do to them eating pretty much everything. As well as them being open to ranging around larger areas and nothing being a natural predator of them. Before anyone would actually preform a management plan for this it would be important to run a study and get accurate information on how many black bears there are in certain areas to see if we really do need to be decreasing or increasing or holding it the same. Otherwise you could hurt t he population in a major way with bad management practices. For this project so far, we have made a GIS map of the range of the American Black Bear as well as found several good sources for the report we have to write about them. We have also discovered that there is very little diversity amongst black bears meaning that it can be difficult to tell one apart from the other. This can be partly due to their recent reduction in migration. But we aren't positive that is the reason at this point, though we are looking forward to coming to that conclusion. The other thing we are most anticipating finding out is how much the black bear population affects other wildlife species populations, such as deer and turkeys. I predict the more bear the less deer but little to no affect on the turkey population, but we are very much looking forward to finding out if this prediction is true.

P-12 Matthew Rao, Caleb Bennett, Dalton Dean, Allyson Degrassi
Particulate Matter and its effects on *Brassica rapa*

Particulate matter is defined as microscopic solid or liquid matter suspended in the atmosphere on earth. With the increase of other pollutants such as coal and wood, particulate matter has become a major pollutant. Particulate matter is known for affecting health of humans and possibly plants. This study investigated the effects of solid particulate matter or vacuum dust on *Brassica rapa* growth. We hypothesized that particulate matter would affect the overall growth and the reproductive structures of *B. rapa*. The length of the entire plant, roots, and internode were measured and the reproductive structures of the plant (flowers and buds) were counted. Twenty-four plants were planted as a control and twenty-four plants were planted with particulate matter. All plants were watered every day for twenty-one days and were measured at the end of the twenty-first day. Our results showed significant differences in the number of reproductive structures but surprisingly not in the overall growth. Our hypothesis was supported for reproductive structures, but we cannot reject the null hypothesis for growth. Particulate matter may impact the plants ability to reproduce but has no effect on the overall growth. This suggests that particulate matter covers the leaves of *B rapa*. to decrease the process of photosynthesis requiring the plant to grow past the particulate matter.

P-13 Daniel Hedges Marisa Shannon
Eastern Coyote

The Eastern Coyote (*Canis latrans*) is an important wildlife species to the state of West Virginia. Our pioneer showcase plans to go in depth on multiple aspects of this species. This will include models and visual representations of the animal's impact. For example: Physical characteristic, ecology, history, and management details. Our objective is to educate interested individuals on the Eastern Coyote's role and impact on our local lands. We plan to use local data to see the current condition of the species. Also, data outside of the West Virginia range and create predictions based upon that. "The Eastern Coyote has only in relative recent times expanded its range to the eastern United States. The coyote has been a significant predator in the west and it will likely prove to have the same impacts in the east." (WV DNR). This is an example of the type of information included in our showcase. Recent as well as older information will be combined to have the most accurate management plans. We hope to succeed in our objective to educate and create conversation on the Eastern Coyote. We look forward to the opportunity to present our best work for the pioneer showcase!

P-14 Tessa Jordan, Mason Thomas, Allyson Degrassi
Cold Temperature Effects on *Brassic rapa*

Brassica rapa is a species of fast growing plants related to broccoli and cauliflower which grow in weather typically in between 40-70 degrees Fahrenheit. These plants are usually not found in cold biomes. Our hypothesis is that if the *Brassica rapa* plants are grown on ice then they will not grow. To investigate the effects of cooler soil temperatures on the growth of *Brassica rapa* plants we used ice trays and packs to simulate cooler temperatures. We planted 48 seeds; 24 of these were the treatment which we exposed to temperatures below 32 degrees Fahrenheit each set of control and treatment contained 4 planters. Placing the ice under the treatment planters and changing the ice regularly during watering and recording measurements of soil temperatures which ranged from 65-73 degrees Fahrenheit, both the treatment and control planters soil temperatures seemed to be relatively the same. However, the treatments were receiving periods of cold and heat due to ice melting in between ice changes. Over the

21 day course of the experiment we recorded temperatures of the soil and room and at the end of the experiment we recorded root length, surface area, internode length, number of flowers and buds, and total length of each plant in both treatment and control sets. We discovered that the root length of the treatment plants were exceedingly longer than the control plants with a range of an 18 centimeter difference. The control plants had 7 plant fatalities and 10 plants that did not sprout, the treatment plants had 6 plants that did not sprout. As many of the control plants seemed to die, the treatment plants appeared to maintain health. The light we placed the control under was drying out the control plants more rapidly than the treatment plants under the same light. The ice in the treatment experiment seemed to be cooling the soil preventing the light from completely drying out the soil. We concluded that although our hypothesis was not supported, ice can be beneficial to plants in hot areas and as the Earth's temperature increases this information could be helpful in relation to plant growth.

P-15 Ethan Dawson, Cora Hedrick
The American Red Squirrel (*Tamiasciurus hudsonicus*)

The American Red Squirrel (*Tamiasciurus hudsonicus*), is a small, energetic species in the Pine Squirrel genus (*Tamiasciurus*). This squirrel, like most all squirrels, is enjoyable and intriguing to watch in the woods or in city parks. Their rusty red to grey colorations are pleasing to the eye and their fluffy tails and big brown eyes make them seem gregarious and not the least bit pesky, but asking someone who has had them in their attic, or an outbuilding will disagree. They are a little bit of a nuisance when around human structures, as most small hoarding mammals are. As these squirrels are well known and well-liked by most, research and a compilation of knowledge was gathered to better inform people about this species of squirrel that is native in West Virginia. Along with information on the American Red Squirrel (*Tamiasciurus hudsonicus*), we have included a large amount of management specs, information and plans to best suit this species and its ecological needs. With proper management and information on both the management and species, populations and positive human interactions will both benefit greatly and that is the main goal of this presentation.

P-16 Jacob McLaughlin, Kurt Bokesch, Henry Slaughter, Allyson Degrassi
The Effects of Saltwater on *Brassica rapa*

We are conducting this experiment to test the effects of saltwater on plant growth. Specifically, we are curious to see how grass-like plants are affected by excessive salt use, especially pertaining to salt as a snow and ice removal tool. Salt is present as a factor on the growth of plants, because across the nation salt is used as a road treatment during winter to melt snow and prevent the formation of ice on roads. We assumed as a group that the salt runoff would leech into soil in some way and are curious as to how salt may impact the growth of plants. We chose *Brassica rapa* for its ease of growth and its relation to the cruciferous vegetable family. The results of our experiment found that salt has a severe consequence to plant growth as compared to our control. From this we can say that salt almost certainly is a factor in hindering the growth of *B. rapa*.

P-17 Coleden R. Belknap, Kevin L. Evans
Legal LSD: Increasing the Realness of Mock Crime Scenes

This research analyzed multiple compounds that are legal, abundant, cost effective and could test positive in a Sirchie LSD Test Kit to increase the realness of mock crime scenes.

P-18 Preston Allison and Sara Sawyer

Investigating the Impact of Temperature on the Mesoglea of the Sea Anemone *Exaiptasia pallida*

Coral bleaching is the loss of endosymbiotic dinoflagellate algae from the coral. This stress response can be initiated by multiple environmental stressors; however, increased seawater temperature is the most common. Recent evidence has suggested an important role the mesoglea of Cnidarians may mediate in temperature-induced bleaching. The mesoglea of sea anemones is composed of collagen and various other compounds. Because collagen is prevalent in the mesoglea, a common histological stain, the Russell-Movat Pentachrome stain, can be used to observe if temperature stress alters the mesoglea. RMP also stains elastic fibers, mucin, muscle, and nuclei. We are investigating this in the sea anemone *Exaiptasia pallida* because they bleach like coral and are easier to experimentally manipulate. The anemones will be heat shocked from 25°C - 30°C for time periods ranging from 6-48 hrs, preserved in paraffin wax, sectioned, and stained to observe the effect of increased temperature shock on the mesoglea. The underlying mechanisms of temperature-induced bleaching are not well understood making my research a vital aid in understanding this stress response.

P-19 Mitchell Queen and Rico Gazal

North Carolina Logging and Logistics

North Carolina is well known for being of the most influential states in the forest industry. The forest industry of the United States began in North Carolina with the first school of forestry and dendrology established as the Biltmore school of Forestry under renowned forester Carl Alwyn Schenck assisted by the founder of the Society of American Foresters Gifford Pinchot who also served as the first Chief of the United States Forest Service. The Biltmore Forest School offered a one-year course of study, and the curriculum focused on providing traditional classroom lectures in silvicultural theory supplemented with hands on, forest management field training. North Carolina also leads 3rd in the United States in hardwood production and exportation of wood products especially in furniture and wood paneling.

The state's forests and forest products industry are dominated by hardwoods in terms of number of species, acres of timberland, and live standing tree inventory. In 2013, hardwoods produced 397 million cubic feet and softwoods produced 251 million cubic feet. Over 2.5 million acres around of North Carolina's current timberland and 4.3 billion cubic feet of the softwood inventory are Loblolly pine plantations. North Carolina's timberland grows more wood than is harvested. North Carolina's timberlands are growing 50% more softwood and 100% more hardwood than they are harvesting. North Carolina's timber inventory has increased by 45% since 1974. There are no state-sponsored BMPs prescribed specifically for harvesting and utilizing forest/woody material for biomass energy production. This is due in part to North Carolina's forestry regulations. Loggers can be certified in North Carolina, but there is no licensing requirement. Approximately 1,400 loggers participate in a statewide logger certification and training program called the North Carolina Pro Logger Program. The N.C. Forest Service has the responsibility to inspect logging jobs across North Carolina.

P-20 Tyler Moore, and Jeremy Keene
Evaluation of the Diversity within *Diastema*

Diastema is an erect herb within the subtribe Gloxiniinae (Gesneriaceae). *Diastema* can be classified by five finger-like nectary lobes, raceme of paired flower cyme, and fruit dehiscence. Throughout history *Diastema* has notoriously been classified incorrectly, and currently the genus is undergoing taxonomic investigation. *Diastema racemiferum*, the type specimen for the genus, was used for morphological comparison. This specimen was collected from the Island of Salanga, Ecuador. My research has focused primarily on separation of the species within Ecuador. Morphological and molecular studies are being used to complete my goal. Morphological variance has been separated from the available Ecuador specimens in our herbarium. Morphological studies focus emphasis on reproductive characters while making use of vegetative features, as well. Molecular studies are performed to build a better understanding of the evolution of the species and genus. All Ecuador specimens are ready for DNA extraction, PCR, and gel electrophoresis. Future results from the molecular studies will provide more concise answers when building *Diastema*'s phylogeny. My research will aid in the taxonomic investigation of *Diastema*.

P-21 Holly Tucker and Rico Gazal
Forestry in Florida

Florida's timber industry is the number one agricultural industry for the state. It has an interesting history from the Expedition of Panfilo de Narvaez in 1527-1528 to the naval store industry in the 1900's to even the conservation of the Long leaf pine today. Florida also has diverse forests communities. The state of Florida contains five main forest types: Pine, Hardwoods, Mixed pines and hardwoods, Sandhill, and Cypress. There are also multiple micro-cover types like the hardwood swamp covers and the citrus orchards in the south. Florida contains 17 million acres of timber land with most of it being located north of Orlando. About 71 percent of the forest are private and industry owned with 29 percent being local, state, and federally owned. In Florida, there are 37 state forests that contain over 1,070,000 acres and 3 national forests that span approximately 1.2 million acres. Approximately 4 million people visit Florida's forests each year with an additional 234,000 people visited forests to hunt.

P-22 Bethany Mote and Dr. Jeremy Keene
Description of two previously unknown species from Panama

Monopyle (Gesneriaceae) is a group of more than 20 described species. The genus is comprised of tropical herbs from Central and South America. During herbarium studies of the genus, two new species were noticed and have been provisionally called *M. attenuata* and *M. erecta*. I am currently working on delineating the morphological differences in the two new species. I have been taking measurements of various features that are important for separating the species from known taxa in the area. *Monopyle sessilis* another species in the area was mistakenly identified as *M. erecta* and moved to the appropriate taxon. Future goals for this project are to build a phylogenetic tree which will help get a better understanding of the evolution of all the related species and to complete a description of both *M. attenuata* and *M. erecta*.

**P-23 Ethan Dawson and Rico Gazal
Forestry in Russia**

Research on forestry in Russia

**P-24 Emily Stoller & Jenae Shar
Determining the Presence of *Wolbachia* in Different Species of Insects and Other Arthropods**

Wolbachia is an inherited bacterium that infects the reproductive tissue of many species of insects and other arthropods. Infection by *Wolbachia* has a variety of effects on the host ranging from reproductive incompatibility between infected and uninfected individuals, to increased fecundity in some hosts. The exact effect of *Wolbachia* on its host depends on the host species and strain of *Wolbachia*. We are investigating which insects in Central West Virginia are infected with *Wolbachia*. Many species of insects are known to be suffering from population declines and whether *Wolbachia* is contributing to this population loss is unclear. In this study we are determining which orders of insects have infected members, so we can calculate the overall infection frequency of insects with *Wolbachia*. To do this, a variety of insects are collected, identified, preserved in ethanol, and then the DNA is extracted from the samples. To determine if the insects are infected with *Wolbachia*, we use two different *Wolbachia* specific primers and PCR. Currently with the insects collected to date, the infection frequency with *Wolbachia* is 56%. Once we have a better understanding of which groups of insects are infected, we can begin to determine which strain of *Wolbachia* is the most prevalent and the potential impacts of the infection.

**P-25 Anthony Murdock and Rico Gazal
Tennessee forest management**

Presentation on forest management in Tennessee

**P-26 Devon Harris, Josiah Nuse, Allyson Degrassi
How *Brassica Rappa* Grows in Sand with and without nutrients.**

We held an experiment where we planted *Brassica rappa* in sand. The control was planted in sand with just water and the treatment was planted in sand with added nutrients to the water. This was to simulate soil with no nutrients in the chance of global climate change.

**P-27 Abigail Johnson and Rico Gazal
Forest Management in Oregon**

The state of Oregon is over halfway forested by three main forest cover types – mixed conifers (lodgepole and ponderosa pine, spruce hemlock and Douglas-fir), Juniper Woodlands, and Subalpine. Almost 80% of the state is classified as timberland which means the timber is in acceptable condition for sawtimber harvesting. This accounts for 29,656,000 acres of timberland. Out of contrary, the majority of the timber being harvested is on privately owned land and not on federal property. There is also a small portion of the forestland that is designated specifically for Native American tribes which is unlike any other state in the nation. Oregon is ranked number one in softwood lumber and plywood output production. This is despite the two major events that completely affected the wood product industry in the United States – the Great Recession and the collapse of the housing market. Out of the 50 plywood mills all across the

United States, fifteen of them are located in Oregon. Forest regulations that slow down the harvesting process of timber are similar to what other states and countries have to be aware of. The Northern Spotted Owl and threatened fish species such as salmon are becoming influencing the way forests and watersheds are managed and protected. Billions of dollars are spent every year to help contribute to the cause and many organizations pitch in to raise awareness on the situation. Luckily, this does not fully prohibit the types of silvicultural practices that are used on both private and government owned forests. Thinnings are commonly prescribed on national forests where larger harvests may take place on private lands. However, all forests are protected by laws and regulations such as the Oregon Forest Practices Act to prevent the biggest fear that forestlands may experience – wildfires.

P-28 Daniel Cameron and David O'Dell

Temporal variability in extractable manganese concentrations in air-dry and field-moist soil

When soils are removed from the field and processed for laboratory studies, changes in chemical properties may occur. Field-moist soil (approximately 40 percent water on an air-dry basis) was collected and passed through a 2 mm screen. After thorough mixing, half the soil was air dried (approximately 3 percent moisture). Samples were further divided with half of the field-moist and air-dried soil stored at room temperature and the other half stored in a refrigerator at 5 °C. Quadruplicate samples of each soil were analyzed at one-week intervals by extracting the equivalent of 10 grams of oven-dry soil with 20 mL of 0.01 M CaCl₂ for 48 h followed by analysis using atomic absorption spectrophotometry. Preliminary results showed no significant difference between refrigerated and room-temperature soil manganese concentrations, but differences between air-dry and field-moist soil manganese concentrations were observed. Air -dried soil exhibited higher extractable manganese, even when accounting for the dilution effect of the soil moisture. This indicates the difference is due to changes in the soil solution thermodynamics rather than to dilution of a highly soluble manganese salt by the higher soil moisture. Soil analysis will continue for a period of twelve weeks to examine the changes in extractable manganese for both moisture contents.

P-29 Quincy Band and Rico Gazal

Landscape Disturbance Index of West Virginia

The land is an important resource and how we use it matters. This is because if we are not careful then we can damage it beyond repair. In this research project, a way to monitor these potentially dangerous changes in land use and the land cover comes in the form of a disturbance index. A disturbance index is a representation of many different risk factors that have been compiled together and then divided into groups. Even though such an index already exists for the state of West Virginia, it is not county specific and was only able to be created through a highly complicated process. In this research project, a simpler way to create such an index was made. This was done by identifying risk factors or landscape features that are evidence of land use conversion and the degradation of the natural land cover. Once identified, these risk factors were then divided up by county and the number of each was recorded. The density of each risk factor within each county was calculated and was divided into five groups and mapped. The five-level classification system to classify the landscape disturbance in West Virginia include: highly intact, intact, transitional, at-risk, and highly disturbed and each was represented by a different color on the map. This index-based county classification involves three disturbance indicators such as non-forested areas, road and well density. The disturbance index map shows that Jefferson, Brooke, Ohio, Hancock, Berkeley, Harrison, Mason, Wood, Barbour, and Taylor counties are considered highly disturbed and are the top ten areas at the highest risk. The map also reveals that the top five counties in

the highly intact category and so at the least risk were Webster, McDowell, Boone, Wyoming, and Mingo counties. Overall this index and accompanying map shows the areas that are at the most and least risk and so can advise and influence future conservation planning. Being able to use this tool for future planning will help us to truly use our land in a wiser and better way.

P-30 Derek Waugh and Jeremy Keene

Understanding species diversity within the genus *Pseudodiastema*

Pseudodiastema (Gesneriaceae) is a provisional genus name for a segregate of the genus *Diastema*. The new segregate genus differs in habit, bracts, and inflorescences. I have been working to collect morphological and molecular data, since the start of the semester. Morphological studies have focused on the traits that delineate the new genus from *Diastema*. Molecular studies will focus on both nuclear and chloroplast gene regions to understand the complex evolutionary history of the group. The use of both types of genes will allow for comparisons of ploidy level and hybridization. We have started to describe the genus of *Pseudodiastema*. A formal description of the genus will provide a starting point that will lead to the description of many species in the new genus. My research will allow for the understanding of this new group and help conservation studies that are of the utmost importance in tropical habitats.

P-31 Jonathon Shreve and Rico Gazal

The practice of forest management in coalition with the NWTF

Throughout the entire United States, many states or areas have national forest lands that encompass a large area and are federally funded and managed. Many forests are managed for the value of their timber but also in aiding the growth of wildlife. This is no exception for the wild turkey. Turkeys need a diverse habitat in order to flourish, and in this one national forest the presentation will be talking about, the population is on a decline due to the lack of management being provided, also talking about the habitat types needed and types of cuts that will provide them with it. In the presentation, it discusses the background of the George Washington National Forest as well as past usage of the land. It also discuss the history of the wild turkey and the proper management practices in order to help them flourish. To tie it all together, it will talk about how the US Forest Service is partnering with the NWTF to fund the management needed to promote the growth of the wild turkey.