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Layers of Loss and Impact: Exploring the Effects of Hurricane Helene in Appalachia

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Abstract

Layers of Loss and Impact is a series of photographs that examines the implications of climate change as evidenced by Hurricane Helene's effects on Western North Carolina. As global temperatures rise due to human activity, storms and natural disasters are becoming more frequent and severe. This research places an emphasis on the lasting influences of climate-related disasters on both human lives and ecosystems, as well as explores the resilience of these communities as they recover over time. In its completion, this project is presented as a solo exhibition of photographic prints made throughout Southern Appalachia in the year and a half following Hurricane Helene in 2024. Artistic influences are pulled from disaster documentary and photojournalism practices, as well as the environmental photography movement, to help inform the work and art-making process. Layered images and post-production workflows aim to convey narrative within the series, documenting and sharing a story of loss and resilience, visualizing the lived reality of climate change through a medium that allows the work to reach viewers who otherwise would not be able to understand the full scope of this event. In addition to photography, this project incorporates environmental practices and research, investigating the effects of

climate warming on storm system intensity and the influence of these storms throughout the region. Overall, this work is designed to draw attention to the long-term ecological and social consequences of climate change on all aspects of life, encouraging the viewer to ask questions and functioning as a means of advocacy for climate reform.

Introduction

On September 27, 2024, Hurricane Helene made landfall in Western North Carolina, a severe weather event that drastically altered the area, as normally calm rivers became raging torrents, destroying homes, sweeping away cars, and disrupting various aspects of the environment. This storm was strongly related to climate warming, which allowed the system to grow in intensity and hit an area situated in the mountains and over three hundred miles from the nearest shoreline. Over a full year later, Western North Carolina is still facing impacts from the storm and working as a community to recover.

As a photographer and environmental activist, I began working to combine studio art practices with scientific research and document the results of climate change as observed through Hurricane Helene. In the wake of the storm, I created a series of images that focused on showcasing community disruptions and exploring ideas of regrowth and resilience throughout Appalachia. In the completion of this project, a solo exhibition of these prints were installed in Owen Hall's S. Tucker Cooke Gallery, allowing the public to visualize these large-scale climate shifts and consider the guiding research question of "How can photography be used as a tool to portray environmental impacts and community resilience in the wake of climate related disasters and their effects on Western North Carolina?"

Intellectual and Conceptual Support

Climate Warming and Storm Intensity

Described as a 1,000-year storm, Hurricane Helene brought record breaking flooding and damage to Southern Appalachia. But how was it that the impacts of this storm were so severe despite the area's distance from the ocean? A large portion of the intensity of this storm can be attributed to elevated temperatures in the Gulf of Mexico, which caused immense amounts of tropical moisture, causing the storm to grow as it moved towards Florida. These spikes in temperatures resulted in a stronger storm and intense weather effects further inland than a typical hurricane would have reached.[1] An additional factor in Helene's intensity was a line of slow-moving storms that formed along a stalled cold front,

drawing in tropical moisture from Helene's outer edges.[2] These initial storms saturated the ground with 6-10 inches of rain prior to Helene reaching the area, leading to heightened flooding throughout the region during the days that followed. Overall, the factors that led to the intensity of this weather event are strongly correlated to the burning of fossil fuels and increasing sea surface temperatures. As the climate warms and temperatures continue to rise, the intensity and severity of storm systems will continue to increase, resulting in increased loss in terms of both physical damage and ecological impacts.[3]

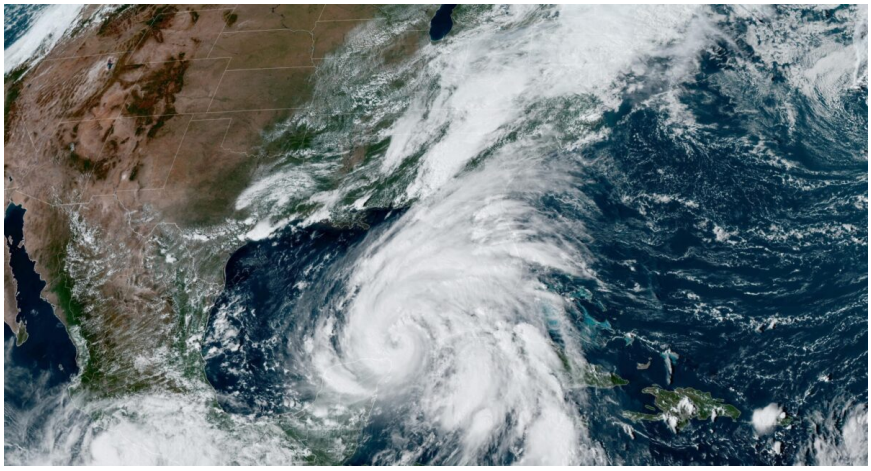

Figure 1. Hurricane Helene in the Gulf of Mexico. Image by NOAA's GOES-16 satellite. September 25, 2024.

Social Impacts of Hurricane Helene

This climate event has created lasting disruptions to almost all aspects of life, resulting in a long and slow recovery both mentally and physically. The loss of access to services such as water, electricity, internet, and telephone connections left these areas cut off from news and information as well as evacuation routes in the days and months following Helene. Not only did the loss of services complicate recovery efforts, but they also present themselves in psychological ways through increased anxiety, PTSD, survivors' guilt, and other trauma-induced behavioral changes.[4]

The physical changes seen throughout Southern Appalachia were also severe and continue to cause long-term issues throughout the region. This storm caused immense damage to infrastructure through landslide activity, record breaking precipitation levels, and high-speed winds.[5] Areas were left vulnerable to physical disruptions such as the destruction of roads and bridges, and the loss of homes and businesses. The storm was estimated to have impacted more than 73,000 homes, leaving many community members displaced long term. The housing crisis created by Helene has caused economic strain

throughout the area and increased unemployment rates, continuing to disrupt lifestyles even a year and a half later.[6]

Ecological Impacts of Hurricane Helene

The impacts of Hurricane Helene remain prevalent in Appalachia and continue to not only affect human lives but pose a continued risk to the environment as well. This ecological strain is evident through factors such as forest damage, with aerial surveying and satellite data showing moderate-to-catastrophic damage on more than 190,000 acres of National Forest land. [7] The loss of these forests extends beyond just the immediate destruction of fallen trees, leaving the area vulnerable for future environmental threats. Large amounts of debris and fallen trees provide fuel and leave the area susceptible to wildfires.[8] Additionally, the large scale tree loss and vegetation changes leave areas vulnerable to invasive species growth, which can inhibit new native plant and tree growth long term, further delaying ecological recovery in the area.[9] Through examining the influences of forest loss on wider ecological systems, it is apparent that the risks associated with climate influenced weather events is severe.

In addition to forest health and plant growth, river channels and watershed health have also been severely impacted due to Hurricane Helene. Copious amounts of pollutants contaminated water sources, as sewage systems and septic tanks were damaged and debris from infrastructure washed into creeks, lakes, and rivers. Sediment was washed into these bodies of water due to erosion caused by floodwaters, increasing the risk to ecosystems long term and harming species that reside in many of these water sources.[10] As a whole, these climate-induced stressors highlight the continued risk to ecological diversity that is brought on by the growing climate crisis, and bring to light the importance of reform.

Artistic Practice and Influences

As a photographer with an environmental science background, living through Hurricane Helene and witnessing the prolonged recovery efforts in Western North Carolina inspired me to utilize my artistic practice to draw attention to the ongoing climate crisis. I began photographing the area soon after the storm hit, and over the course of the next year and a half, researched and developed this project.

The topic of Hurricane Helene and climate-influenced natural disasters is an extremely complex one, and the creation of this work required multiple processes to properly document the scope of impacts. Artistic influences are pulled from various areas to gain insight into the medium of photography, photojournalism, and environmental and

landscape photography. These sources have aided in understanding different methods of engaging a viewer, as well as how to convey a narrative and intertwine large scale issues such into an artwork. Throughout the entirety of this project's production, this research informed the body of work, from planning and shooting all the way to post production editing and presentation.

Hurricane Katrina Photo-Documentation

Documentary images taken during and after Hurricane Katrina hit New Orleans in August of 2005 strongly guide this body of work. Similar to Helene, Katrina disrupted an entire region in every aspect of life. This Category 5 storm resulted in the deaths of an estimated 1,833 people and the destruction of more than 200,000 homes, causing one of the largest relocations of people in US history.[11] Following Katrina, many photographers began documenting both the state of the city and the emotions surrounding going back to a place now tainted with memories of loss and grief. These scenes were documented for years after the storm and followed recovery efforts in the area long term. This broad collection of images has been very influential on my body of work, showing how important documentation is in the wake of these large-scale natural disasters, and how through photography, a wider range of people are able to be informed about these stories. Even years later, this work continues to live on and be a testament to the experiences of that community.

Robert Paliordi's series of images titled *"After the Flood,"* uses photographs of rooms and homes as metaphors and catalysts for states of being, documenting the chaos of this event through the lens of infrastructural damage.[12] Another photographer, Clarence Williams, who was visiting New Orleans when Katrina hit, documented not only the event itself, but the long term issues of racism and poverty in the area following Katrina.[13] Paliordi and Williams significantly influence my work through their ability to convey the severity of the event in an emotional way, placing the viewer within the grief. Within my studio practice and solo exhibition, I am striving to create a body of work that will carry a similar importance, providing context to individual stories, while also educating and informing a wider audience of the topic.

Figure 2. Robert Paliordi, After the Flood, March 2006.

Figure 3. Clarence Williams, 2006.

Photojournalism and Environmental Photography

The history of photography and more specifically, the role of photojournalism has also informed this body of work. The development of the portable 35mm camera in the 1920s was a significant moment in photojournalism that led to photographers being able to shoot non-staged photos and capture images in a variety of places. This led to more documentary style work which has been influential to the journalistic aspects of my work. Within this project, I am capturing pre-existing scenes and images, an attribute that is seen in work by photojournalists such as Henri Cartier-Bresson, who incorporates different compositional elements and angles to capture a scene in a visually interesting way while also conveying a narrative.[14] There is a sense of authenticity and decisive moment within Cartier-Bresson's work that has been influential to the way I frame and capture an image.

Figure 4. Henri Cartier-Bresson, Simiane-la-Rotonde, 1969.

As an environmental photographer, Ansel Adams has also been a significant artist for me as his work helped to bridge the gap between photography and many real-world issues. In one body of work known as *"The Mural Project,"* Adams worked on a collection of about twenty-six large scale, mural sized prints taken 1941 and 1942. These prints featured different landscapes within the National Parks and were displayed in the US Department of the Interior building along with quotes and excerpts from writings of Theodore Roosevelt. This work, along with many of the other photographs Adams would create in the rest of his career, aim to bring attention to and celebrate the natural world, bringing to life the idea of environmental photography, and the role of art as a means of environmental justice.[15] Adams' work strongly relates to the concept of my own, which serves as a means of environmental activism and awareness surrounding climate change. This body of work, much like Adams', aims to educate and share information about an area or landscape that many individuals would otherwise never experience, while also sharing knowledge about topics like environmental preservation and climate change.

Figure 5. Ansel Adams, Cathedral Peak and Lake, 1938.

The Rephotographic Survey Project

Lastly, the concept of rephotography and the measure of time and change have motivated this research. Historically, photography has been used as an environmental research tool to provide visual representation of large-scale ecological changes. Artists such as Mark Klett and Byron Wolfe used this process to create visual representations of land change in the American West over years of human intervention. These bodies of work, primarily the initial project titled *"The Rephotographic Survey,"* have been an extremely relevant influence within this project. This series presents historical 19th-century photographs side by side with present day images at the same sites, allowing a visual representation of the relationship between time and change.[17] In later projects *"Reconstructing the View*" and *"Third View,"* Klett and Wolfe continue this established way of creating time based environmental works known as re-photography while also implementing composite workflows. This work inspired me to shift towards revisiting sites from the earlier stages in this project, making observations of the recovery and resilience of those areas. This conceptual shift in my artwork led to experimentation in image composite processes, leading to a workflow of multi-layer transparency composite pieces. Klett and Wolfe's work, much like my own, utilizes environmental science and photography to create work that encourages the viewer to observe and make connections surrounding important environmental issues.

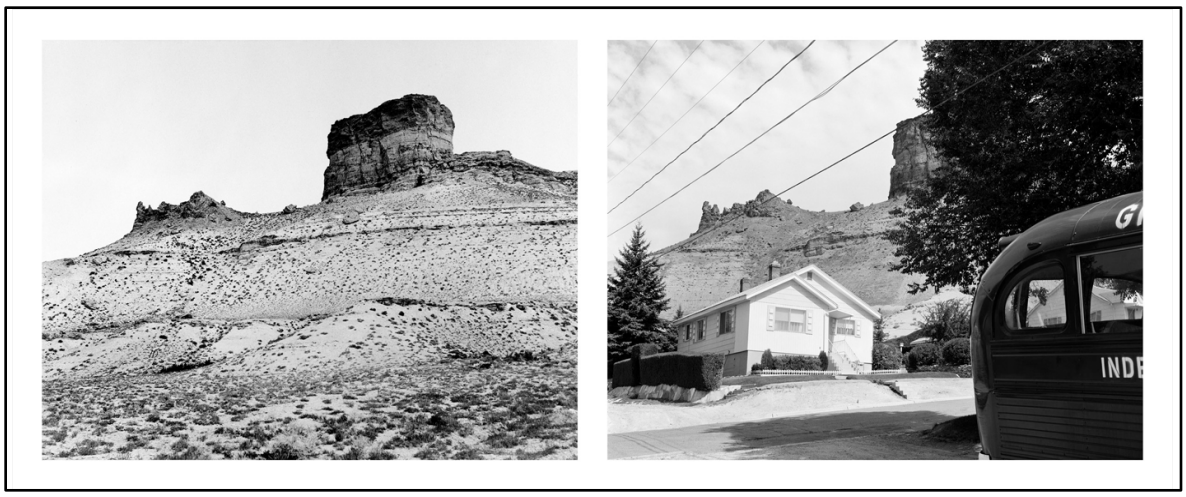

Figure 6. (Left) Timothy O'Sullivan, Green River Buttes, Green River, WY, 1872. **(Right)** Mark Klett Gordon Bushaw for Rephotographic Survey Project, Castle Rock, Green River, WY, 1979.

Figure 7. Mark Klett and Byron Wolfe, 2010. Reconstructing the View Project. All that matched the view of Thomas Moran's sketch "Grand Cañon of the Colorado" with pieces from Dutton Point, Muav Saddle, and Swamp Point. Back: Thomas Moran, 1873. Grand Cañon of the Colorado. Gilcrease Museum, Tulsa.

Art Making Process

When creating this body of work, the process begins with a research-based approach to identifying specific sites or areas that have been heavily altered by the storm. Through pinpointing riverways and areas with dynamic land movement, I am able to find areas in which ecosystems have been impacted. From here, I begin photographing these landscapes on a Nikon DSLR camera to incorporate a variety of production processes. This body of work features images created in multiple distinct workflows; straight images and

high dynamic range composites, panoramic composite pieces, and multi-layered stacked composite images, all of which require different raw material to be taken at these sites. Both Adobe Lightroom and Photoshop are utilized throughout my artmaking process, as well as large format inkjet printing, which take the images to their final display form.

Single Frame Images and High Dynamic Range Composites

Straight, single frame images, as well as high dynamic range composites that mimic a single image are utilized throughout this body of work to add context and inform the more conceptual pieces. These images are simpler, in terms of both image making and editing. In more complex situations where the tonal range is too wide to be accurately rendered in a single image, multiple frames of a single image are taken with the camera adjusted to different exposures. These frames are then composited together in Photoshop to properly expose highlights, shadows, and midranges, resulting in an image with the most information possible. The final versions of these pieces are adjusted post production to alter components such as highlights, shadows, contrast, and saturation. Both of these workflows result in 24” x 18” images, which provide the viewer with a more photojournalistic, documentary-based approach to photography and artmaking.

Figure 8. Natalie Akins, It’s Just Broken Glass, digital image, 2025.

Panoramic Image Composites

This body of work also incorporates images produced in a panoramic, composite workflow. This process entails shooting multiple frames vertically using a tripod as the camera is rotated horizontally across the landscape. Within each of these frames there are multiple exposures recorded, which help to capture the best range for the highlights,

midtones, and shadows, and gives the resulting image the most information possible. In post production, these images are lined up and stitched together in Photoshop to create a larger horizontal image. Parts of each image are made visible using layer masking and selection tools, which help to highlight the different exposures shot while in the field. Once this seamless image is constructed, it is then brought back into Adobe Lightroom, where it is adjusted and edited in terms of highlights, shadows, saturation, and other visual aspects. This panoramic composite workflow results in an image in which the aspect ratio is wider than traditional images, allowing the viewer to engage with the landscape in a more active way, making these images feel more personal and immersive.

Figure 9. Natalie Akins, Derailed, panoramic composite digital image, 2025.

Multi-Layer Image Composites

Additionally, within this body of work images combine two completely different photos into one by adjusting the transparency. By taking one image that shows disruptions to natural environments and layering it with an image of a structure that portrays impact to human life, these pieces are working to showcase the extensive changes in multiple aspects of the area. The composite starts with the base layer photograph, which is edited to adjust contrast and lighting, as well as lower the saturation. On top of this image, a second image is added; through using selection tools in Photoshop, different areas of this image are selected and lowered in transparency, allowing the base image to show through. This creates a two layered final image in which the viewer is pushed to engage with the work, going back and forth between the two to pull deeper meaning out of the image and make connections as to the vast influences of climate change within a community.

Figure 10. Natalie Akins, Layers, multi-layer composite digital image, 2025.

This multi-image composite process is also utilized to portray time and change through layering multiple images of the same site taken across a span of time. Certain portions of each image are shown through to document seasonal change and recovery efforts. These pieces in particular showcase regrowth and resilience, while also highlighting the long road to recovery that faces many of these areas.

Figure 11. Natalie Akins, Eight Months' Time, multi-layer composite digital image, 2025.

Printing and Gallery Installation

Once a satisfactory image is made, the work moves into the printing process. Various test strips are created and printed in order to assure the quality of the image transfers correctly from the monitor to the print. Within these test strips, multiple variations of small areas of the image are created to see how contrast, colors, highlights, and shadows show

up when printed. These layers are then adjusted and applied to different areas of the print until an adequate result is reached, at which point the image is ready to be printed at its final scale using an Epson SureColor P9570 48-Inch Wide-Format Inkjet Printer. The full-scale print sizes range from 24” x 18” at the smallest, to 46” x 24” at the largest; the print size works to use scale to immerse the viewer into the landscape and further emphasize the immense impact of the climate event.

Figure 12. Printing in Progress - Test Strips.

Final prints were installed and shown in the S. Tucker Cooke gallery, where they communicated with each other within the space to speak about environmental and community impacts and regrowth after climate-related stressors. Groupings of images were created according to color and visual weight as well as content and aimed to create a balanced sense of unity within the gallery. The smaller, straight images were stacked in pairs of two and helped to inform the larger composite works.

This workflow provides a way of working both compositionally and conceptually. Portions of the body of work appeal to the reality of the landscape, while others appeal more to the conceptual interpretation of the topic, encouraging the viewer to take in the full scale of the event. The large size of the prints, as well as the multiple workflows, engage the viewer in a non-traditional way, pushing the image in ways that force the viewers to ask questions and interact with the work in an intentional way.

Figure 13. Layers of Loss and Impact - Gallery View.

Figure 14. Layers of Loss and Impact - Gallery View.

Conclusion

Over the past three semesters, this body of work has developed and grown into a final exhibition featuring images at various stages of the devastation and regrowth faced by Southern Appalachia in the wake of Hurricane Helene. These images not only serve as a means of documentation for this community but can also be used as a way of portraying environmental activism and the urgent need for meaningful climate reform. The nature of photography as a medium allows this body of work to reach a range of people who otherwise would not have been able to understand the depth and context of these impacts. In its completion, this project aims to create dialogue and awareness about the implications of climate change and serves as a foundation for future environmental based photography work surrounding the complex and growing issue of climate reform.

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