As the Marcellus by Design Studio began its journey to better understand the impacts of the natural gas drilling in Tioga County, this area became more than simply a research site. The issues and topics that arose in relation to the gas industry ranged from Food and Energy Futures, Sense of Place, to Historic Sites and Landscapes. As a studio, some of our goals were to “understand landscape design and planning challenges for cultural and scenic resource conservation in areas undergoing natural resource development. Appreciate the need to identify working solutions for local communities. Create sustainable, long-term design solutions for communities in the northern tier counties in Pennsylvania that enable development of natural gas resources, identify future resource use strategies, ensure sustainable economic benefits for local settlements, and protect and conserve natural, agricultural and cultural resources for communities and land owners as part of local, watershed and regional design and planning strategies. Communicate resulting design projects to appropriate stakeholders using a combination of graphic and written approaches.”

Historic Sites and Landscapes, as a focus topic, has a unique approach to understanding the effects and response to the natural gas industry. There are various aspects of the development from natural gas extraction from the marcellus shale that directly and indirectly affect the historic sites and landscapes of the County. They include alterations of views and vistas, truck traffic and drilling interrupting the peaceful quiet of the countryside and ridge-top, economic growth that does not blend with the historic design and layout, and destruction of historic vegetation along scenic roadsides.

Community pride may increase if attention can be brought to more historic sites and landscapes in Tioga County. If more areas of interest are recognized as historically significant sites, the local government can establish various levels of preservation. As additional sites are publicly identified as historically important, locals and visitors will begin to see how this landscape is a very special place worth protecting.

**Tioga County Iconic Landscapes**

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The use of the National Register of Historic Places, Panoramio, and local newspapers allowed for the identification of key vistas, landmarks, and local interest throughout Tioga County.

According to the National Register of Historic Places, these places form "the official list of the Nation's historic places worthy of preservation." The National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.

Through the use of social media sites such as Panoramio, a geolocation-oriented photo sharing website intended to inform and recognize popular views or sites, we were able to identify popular sites and landmarks of the Tioga Region. Crowdsourcing allows us to find what interests the locals and visitors to Tioga County.

Interact with Panoramio here.
After landmarks and views were identified through our research and geographically placed using ArcGIS, we ran visibility and viewshed analyses on the points using the topography of the county. The colored areas on the vista maps show what is visible from each vista, divided by high point overlooks, and views from lowpoints within the valleys. The landmark map shows from which points the landmarks are visible, with the warmer colors indicating a greater number of landmarks visible. The Overlay map shows the layering of these three maps to show the areas with the greatest overlap and importance. The lightest green areas are higher priority areas because disturbances to these areas would create the largest negative impacts.
Through the use of crowdsourcing and ArcGIS analyses on various aspects of importance related to historic sites and landscapes, attention can be directed to focus areas in Tioga county. Key features that make up physical and genealogical components of the landscape of Tioga County are then determined. A base map of Tioga County showing landuse and natural features is used as the background for each analysis map.

State Parks, forested areas, farmland, water bodies, and town centers are all shown on the base map. Larger town centers are labeled on the map to create additional reference points.
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On the first map, town centers, water bodies and the view points and landmarks, previously identified, are the first features called out. The town centers and landmarks are important to the genealogical side of the county, while the water bodies and vistas are key to the physical side of the county.

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**Historic Sites & Landscapes**

*MARCELLUS BY DESIGN* The Pennsylvania State University
Analysis

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The next step was to encompass all the features into certain areas. This process makes it easier to identify the zones that have every aspect within.

Historic Sites & Landscapes  MARCELLUS BY DESIGN  The Pennsylvania State University
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The next step was overlaying the ridge tops and views on top of the circled areas from the previous map. These features add more to the physical qualities of Tioga County.
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Forming these isolated areas within the county, identifying a series of important features is a device to establishing priorities. This allows us to work at a design focused scale. These are simply areas to use as recommended focus areas. This does not mean that the surrounding land is not important, it is simply a way to narrow down the scale for design purposes.
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The final step of analysis was tying these focus areas into the Marcellus Shale natural gas development. On this first map, the existing natural gas wells are portrayed to show how the areas are already affected by this development. Tioga County is not an untouched place as it relates to the natural gas development. This is already part of the history. With this in mind, it is important to make sure the historic condition of the land is not erased as we move into the future of the natural gas development.
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This map was then overlayed with the future projection of the wells. Some areas can be seen as having higher concentrations of wells, making them a possible sub-focus for designers. For the future, these zones might be important to preserving and limiting the amount of wells drilled, to protect the natural and cultural surrounds of the historic sites and landscapes of Tioga County.
**Concept Sketches**

Small scale design solutions may be applied to mitigate the disturbances of the natural gas industry. Through the use of these basic concepts derived from the *Pennsylvania Wilds Design Guidelines*, the historic integrity of the landscape may be preserved before larger scale designs are implemented for enhanced appreciation of these landscapes.
This site was selected as an example of an existing natural gas wellpad that disrupts the historic quality the county’s scenery. It serves as a demonstration of ways in which design solutions may diminish the visual presence of the industry in order to avoid detracting from this scenic drive. This road offers views of historic barns, agricultural land, and forested plateau tops, and the iconic quality of the views along the road should be preserved. Fast-growing vegetation was placed around the site and a small landform blocks the unsightly pad. The driveway was shortened as well in order to keep as much of the surrounding vegetation in place.
Design Phase: Roadside Overlook

Once small scale design solutions have been implemented in order to subdue the natural gas industry’s negative impacts on the landscape, appreciation of the historic landscape may be expanded. A preliminary plan for a road-side pull-off shows an example of a design that invites the public to enjoy and admire the beauty of the County. The iconic waves of the Allegheny plateau’s agricultural valleys and forested ridges may can admired from an overlook above. Widened appreciation of the historic landscape will lead to an enhanced desire to protect it, and preserve the existing culture of Tioga County.

The overlook balcony features a stone paver in the shape of Tioga County, blasted with the topography of the Allegheny plateau. It adds a personal and a very personal and site specific element to this simple overlook structure made from local stone. It also allows for visitors to interact directly with the map and find their location as they gaze down. The fencing around the balcony is consistent with the vernacular of local Pennsylvania farms and gives a nod to the rural heritage of this place as well.
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As an alternative to looking at the Historic Sites and Landscapes through ArcGIS data and published articles of information, a more creative approach was also taken. A photo Mosaic and Word Map of Tioga County, as well as a Wordle, highlighting key aspects of design and focus points, were made to represent the topics and data in an organic, messier format. This provides another way to understand the topics and points discussed in researching and learning about Historic Sites and Landscapes.

A mosaic picture map of Tioga County was developed using the crowdsourcing data and the National Register of Historic Places and an aerial of the landscape. Images taken from Google street view were taken to overlay on the aerial map. The site points showing the vista points, local landmarks and registered landmarks were located on the map.

A word map of Tioga County was produced as an alternative creative map. It identifies the major roadways, Route 15 and Route 6, town centers, lakes and landuse areas made up of the ridge tops and valleys.
Shannon is studying Landscape Architecture at the Pennsylvania State University. She has been the secretary for the Landscape Architecture Student Society (LASS) and a dormitory Resident Assistant (RA). Her experiences working with people and spending time outdoors influenced her desire to create places for people to connect with one another through their natural surroundings. She looks forward to combining design with nature to develop timeless spaces for people to enjoy for generations.

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Amy Foster is a student at Penn State University earning her bachelor of landscape architecture with a minor in international studies. She is originally from Sharon Massachusetts, and has been inspired by the landscapes of her home in New England as well as her travels across the United States and various international locations. She has a broad range of interests within landscape architecture and hopes to gain additional work experience that guides her to a specific facet of the profession in the future.