My research interests lie in the field of environmental economics, using modern econometric methods for causal inference as well as several tools from the non-market valuation toolbox. In my papers, I study the effects of policies to protect and restore the environment, and I explore sources of heterogeneity in individuals' preferences for environmental amenities. Environmental policies that focus on ecosystem conservation and restoration not only provide a variety of environmental benefits, but they may also generate other unintended impacts on local economies, social structures, and well-being. My current research focuses on three related questions on ecosystem conservation and restoration, generating empirical evidence to improve our understanding of the benefits, costs, and impacts of programs to restore and protect both rural and urban environments.

Poor and minority people face disproportionately high exposure to pollution and low public goods provision. Environmental justice (EJ) policies seek to reduce inequality through public goods provisions. However, providing public goods in urban areas may increase segregation and lead to gentrification. In my job market paper, I focus on one of the largest tree-planting programs in the US, the MillionTreeNYC Program, and examine the impact of an increased supply of urban street trees on housing values and neighborhood composition. To correct the extant unbalanced distribution of urban green spaces, the program specifically prioritized neighborhoods with fewer green spaces. I apply a difference-in-difference (DID) hedonic model to examine the impact of urban tree planting on housing prices in NYC at the property level. The results show that property values near tree-planting locations increase by 1.2%; on average, the value of properties located on streets with trees planted by the program is $6309 higher than they would have been without the trees. Results from a zip-code level panel fixed effects model confirm that street tree planting has a positive and significant impact on housing prices. Based on a back of the envelope calculation, the program increases the total housing values by 1.09 billion dollars and property tax revenue by $7.6 million, which implies that the benefits exceed the costs of the program. Finally, I analyze whether gentrification happens when communities are given more trees using a DID model with a continuous treatment (tree planting intensity). I find that a higher intensity of street tree planting attracts more educated and younger households. It also leads to the in-migration of a predominantly white population. The results suggest that residential sorting induced by urban tree planting programs does take place, yet the magnitudes of neighborhood effects found in this paper are relatively small compared to the sizable effects found in previous environmental gentrification literature that focus on other EJ policies such as superfund clean-ups. This small effect indicates that it is possible for so-called "Environmental-Justice" policies to provide public goods without significantly displacing of the existing population.

Just like environmental improvements can have unintended consequences in urban areas, and the net economic impact of conservation on the rural economy is often unclear as well. Conservation programs may entail a trade-off between environmental quality and local economic growth if they negatively affect local agricultural and resource production to generate environmental benefits. Furthermore, rural conservation may also promote rural economic growth by drawing people to live in and visit the area, providing more non-farm job opportunities. In a chapter of my dissertation, I study the reduced-form effects of the Conservation Reserve Program (CRP) on local employment. I examine the impact of CRP enrollment on local employment for the entire US to generate a nation-wide analysis of the impacts of agricultural land retirement on the rural

economy. Using a panel fixed effects model with an instrumental variable (IV) method, I find that the CRP program reduces farm employment, but also provides more non-farm job opportunities; as a result, the total number of jobs in the whole economy increases with CRP enrollment. I show further how the effects of the CRP vary by region. As a highly agriculture-dependent region, the estimated impacts are significant in the Midwest. In another paper, I conduct a nation-wide assessment of the economic impacts of bison reintroduction. Rural communities can take economic well-being into account when considering their future decisions regarding bison restoration. Bison reintroduction provides chances to help local tourism through wildlife marketing. However, there is an opportunity cost to land dedicated to bison. I estimate the impact of bison reintroduction on local employment, population, and per capita income using cross-sectional propensity score matching (PSM), matching with DID, and the synthetic control method (SCM). I find little evidence of a significant impact of bison reintroduction on any measure of local economic activity. The empirical evidence generated from these two studies indicates that conservation and restoration do not limit rural economic development.

Even if environmental conservation programs do not yield "conventional" economic benefits, people may still have a positive willingness to pay (WTP) for conservation. This WTP is not time invariant: the values that different people place on nature may be changing as a consequence of urbanization. As nature near population centers becomes scarcer, the marginal value of nature could increase. At the same time, as people grow up with less exposure to nature, their WTP for conservation and restoration may decline. In the final chapter of my dissertation, I carry out a choice experiment survey in three different states - Illinois, Iowa, and Minnesota - to estimate individuals' willingness to pay (WTP) for different features of a hypothetical restored grassland, including recreational amenities. I also gather data on respondents' early-life experience with and exposure to nature and test whether those features of an individual's childhood affects their current WTP for preserving nature. I use a mixed multinomial logit model and a random parameter latent class model to study the effects of childhood experiences on WTP for grassland restoration. The results reveal how the demand for environmental goods is affected by an individual's childhood experience. This phenomenon may provide a partial new explanation for the stylized fact that people in poor and minority communities have less access to urban green spaces. People "vote with their feet" regarding levels of environmental amenity. Poor and minority populations who had less interaction with nature in their childhood may have lower WTP for nature as adults and be less willing to pay a premium to live near nature.

In future work, I anticipate continuing my empirical research in environmental economics. In the short term, I have research plans underway to identify whether the provision of urban trees by government programs crowd in/out individual's tree planting decision. I also plan to study if the urban tree canopy is an effective investment for reducing urban heat island effects, saving energy consumption, and improving public health. Looking ahead, when studying the neighborhood effects of public goods provisions, I seek to acquire and analyze information from digital platforms social media to capture real-time changes in neighborhood compositions. This information can be used to predict if neighborhoods are in the process of gentrifying.