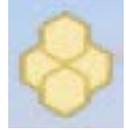




# NARSC NEWS



## Words from the Executive Director



NARSC News is now in its third year. Thanks to Liz Mack and Ralph McLaughlin for their sterling work in bringing this newsletter to us as NARSC News co-editors. Thanks to Ralph for contributing so much to the development of the newsletter and playing such an integral part in getting it off the ground. In December Ralph stepped down as co-editor. Fortunately we were able to find a very able

replacement for Ralph when Ran Wei of the University of Utah agreed to step up and assume the responsibility of co-editor. This November the North American Meetings of RSAI International will be held in Portland, Oregon, November 11-14. I hope that you will join us in the City of Roses for what promises to be another enjoyable and stimulating meeting. The deadline for abstract submissions is July 1 and so is fast approaching. This year's local organizers are Liz Mack and Jaewon Lim of the University of Nevada, Las Vegas. Rachel Franklin of Brown University, for the second year running, is the conference Program Chair. Registration rates have been kept at the same level as last year. More information about the conference can be found at <http://www.narsc.org/newsite/conference/>.



## Words from the Editors

As Neil mentioned, this issue marks the start of the third year of the newsletter. Thanks to the membership, it has been possible to feature new content and reflections on current issues in regional science. Thank you to all that have contributed. If you have ideas please feel free to contact Ran Wei ([ran.wei@utah.edu](mailto:ran.wei@utah.edu)) or Liz Mack ([lizmack287@gmail.com](mailto:lizmack287@gmail.com)).

This June 2015 edition of the newsletter contains thought pieces on energy and climate change from Mark Partridge, Michael Betz, and Sandy Dall'erba. The profiles of junior members of NARSC in this issue are Carlianne Patrick from Georgia State University and Haifeng Liao from the University of Idaho.

In addition to this information, the newsletter highlights recently funded research of the membership. We wish all of you a pleasant summer and look forward to seeing you all at the NARSC meeting in Portland this November.

Elizabeth Mack and Ran Wei, Newsletter Co-Editors

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*Would you like to contribute to the newsletter?*

Contact editors Elizabeth Mack ([lizmack287@gmail.com](mailto:lizmack287@gmail.com)) or Ran Wei ([ran.wei@utah.edu](mailto:ran.wei@utah.edu))



## Maximizing the Gains of Old and New Energy Development for American Rural Communities

by Mark Partridge

Research shows that natural resource-led development is associated with positive demand that increases short-term local economic growth. Such growth is welcome in many communities that long suffered even before the Great Recession. However, there is a large literature that points to possible long-term negative consequences of natural resource-led growth, referred to as the “natural resource curse.” Natural resource intensive economies could suffer from the curse because they often lack economic diversity, are associated with lower levels of educational attainment, possible environmental degradation, and are linked to weaker institutions that make them less resilient to economic downturns and the inevitable commodity bust. Furthermore, volatile commodity prices produce a boom-bust cycle and higher land and labor costs that could crowd out other economic activities from locating in places with energy development.

To assess these issues, the U.S. Department of Agriculture’s Agriculture and Food Research Initiative funded an Ohio State University research team with a one-half million dollar grant. The research team includes Mark Partridge, Alessandra Faggian, Linda Lobao, Michael Betz, Amanda Weinstein, Alexandra Tsvetkova, and Isha Rajbhandari. Mark Partridge is the PI and Swank Chair of Rural-Urban Policy at the Ohio State University. Alessandra Faggian and Linda Lobao are Professors at the Ohio State University in the AED Economics Department and the School Environment and Natural Resources, respectively. Michael Betz is Assistant Professor in the Human Development Department, Amanda Weinstein is Assistant Professor in Economics at the University of Akron, and Alexandra Tsvetkova and Isha Rajbhandari are respectively postdoctoral assistant and PhD student in the AED Economics Department at OSU.

Our research project aims to assess the likelihood of a natural resource curse in the context of new energy development and to identify best practices to improve resiliency. We intend to develop advanced empirical methodologies to estimate short- and long-run socioeconomic impacts of energy development. Our aim is to estimate and compare the impacts across the nation for the three main fossil fuels, coal, oil, and natural gas, emphasizing the role of the shale “revolution” on local communities. We will also examine the differential effects of energy development across different sectors of the economy to assess whether these effects vary across regions based on their population density and previous energy development history.

The study also incorporates a comparative analysis of resource boom impacts across regions to account for spatial heterogeneity and varying pre-conditions such as an existing energy infrastructure and a history of energy development. Additionally, we are analyzing the types of occupations being created in the shale boom areas to better understand the type of human capital that is in demand and its impact on the regional economy. Furthermore, we are examining the relationship between shale developments and interregional migration trends.

An important part of the project is the development of an extension/outreach program to educate the public and officials on the impacts of shale development and assist them in making sustainable long-term plans to take full advantage of energy development. Fifty years of regional science research on household choice of residence and job locations show the importance of including the simultaneity of these selections. But, what is it that we do not understand about putting job and residential locations together that might explain these puzzles for population groups? Demography may index different tastes or preferences, location constraints, productivity or spatial distributions of productivity. The truth is out there for a new generation of scholars to find.

*Mark Partridge is Professor and Swank Chair in Rural-Urban Policy in the Department of Agricultural, Environmental, and Development Economics at Ohio State University.*



## Economic Impacts of Shale Development

by Michael Betz

Rapid expansion of shale energy production has vaulted the United States past Saudi Arabia as the world's largest oil producer. While increased domestic energy production has important strategic implications for the country as a whole, the most profound impacts may be on the small towns and rural areas where the energy extraction is occurring. Over 750 counties sit atop shale plays, most of which are classified as rural or micropolitan. Many of these communities are placing their hope in shale development to reverse the long trend of economic decline and outmigration that many rural communities have experienced.

Local economic impacts from shale development come mainly from two sources: Lease and royalty payments to landowners and increased employment from energy sector jobs, support industry jobs, and induced employment. Employment "multipliers", additional local jobs that result from increased economic activity from more energy sector jobs, are of particular interest to economists because they provide policy makers a better understanding of the aggregate employment impacts on the community. As more studies estimate these multipliers for various shale plays across the United States, evidence is starting to build that most places are not experiencing dramatic employment impacts from shale energy development. Most academic studies are finding multipliers between 1-2, meaning that for every 10 oil and gas jobs created an additional 0-10 local jobs are created. Most counties are only experiencing modest increases in oil and gas employment to begin with and given the accumulating evidence about multiplier effects, should not expect to experience dramatic increases in total employment.

However, many important questions still remain surrounding employment effects from shale development. As shale development progresses within a community, multiplier effects will likely change. Once initial infrastructure is in place, employment supporting the oil and gas industry should dampen. This is demonstrated to some extent by the difference in regional multiplier effects between places like Texas, which had much of the necessary infrastructure in place because of its long history with oil extraction, and Pennsylvania, which has little previous experience with the oil and gas industry and therefore less related infrastructure.

Other important questions surround the medium and long-term effects of shale development. There is an emerging literature that questions the long-term impacts of natural resource specialization in local communities in the U.S., with several studies finding negative long-term associations between natural resource extraction and local economic outcomes. These findings are germane to shale development with regard to how the recent plummet in oil prices will impact employment in local communities. Until recently, shale energy development had only experienced the boom phase. However, in the last half of 2014, low oil prices dramatically slowed drilling of new shale wells. Shale plays that predominantly extract oil have seen marked decreases in drilling rig counts, ending nearly a decade of drilling expansion. This presents an opportunity for researchers to investigate the local impacts of a bust in shale energy development, which remain poorly understood. These and other important questions surrounding shale development's impact on local communities provide new opportunities for innovative research by regional scientists.

*Michael Betz is Assistant Professor in the Department of Human Sciences at Ohio State University.*



## The Economic Impact of Climate Change on US Agriculture - How Can the On-Going Debate Benefit from Regional Science?

by Sandy Dall'erba

The attention generated by the Summer 2012 drought on the Corn Belt or by the current drought in California exemplifies how vital it is for the US agricultural sector to understand climate change and how to mitigate and/or adapt to it. While agriculture is not a significant share of employment (only 1.45% in 2008), the US is the world's largest producer and exporter of agricultural goods. In addition, agriculture impacts many other sectors of the economy such as machinery, chemistry and transportation.

There is little controversy about whether agriculture is sensitive to changes in climatic conditions; however, significant uncertainty exists with respect to the future climate's impact on agriculture. It is anticipated that some regions will be winners and others losers, but it is still unclear whether climate change will bring a net gain or a net loss for US agriculture as a whole (e.g. Mendelsohn et al., 1994). In spite of the surge in studies focusing on measuring the economic impact of climate change, not enough of them pay attention to some important and relevant elements that Regional Scientists are used to deal with in this author's opinion.

First and foremost, more recent studies noting the presence of spatial autocorrelation in their models, notably because nearby regions share similar soil and climate characteristics, but often choose to treat it through spatially correlated omitted variables (e.g. Schlenker et al., 2005; Deschênes and Greenstone, 2007). The absence of spillovers it implies ( $\frac{\partial y_i}{\partial x_j} = 0$ ) does not match reality. For instance, in the state of Arizona where the author lives, most of the surface water used for irrigation comes from Colorado. If less snow were to fall on the Colorado Rockies, it would undoubtedly affect agriculture in AZ. A handful of contributions formally model spillovers (e.g. Polsky, 2004; Seo, 2008) but one could criticize that they are based, as usual, on pure geographical proximity. In a recent application to the Corn Belt, Kang and Dall'erba (2015) suggest to go further by using an exogenous matrix capturing the interregional flows and direction of surface water irrigation.

Second, apart from the distinction between high- vs. low-irrigated counties, the role of spatial heterogeneity has been pretty much ignored in the literature. Yet it is hard to believe that the "right" marginal effects are uniform over space considering that agricultural production spans a variety of climate zones and of watersheds as it occupies up to 42% of the US territory. As such, some of the econometric techniques used in Regional Science such as structural instability, spatial hierarchical models and geographically weighted regressions could help provide deeper, more place-tailored, insights on how local characteristics shape a location's response to climate change.

Third, the author's collaboration with Atmospheric Scientists indicates that most of the current studies may generate biased estimates because they lack any consideration for past (for calibration purposes) and future (for prediction purposes) extreme climate events such as extreme rainfall, drought, heat and cold waves. Yet, their frequency and intensity are projected to increase (IPCC, 2007). In addition, current studies are also guilty of working with freely downloadable but very coarse climate data (at a spatial resolution of 200-300km) when downscaling techniques traditionally used in Atmospheric Sciences can generate data at a 6 times finer scale and reduce the bias on the associated coefficients. Both issues are addressed in Dall'erba and Dominguez (2015) for these reasons.

To sum up, Regional Scientists have a role to play in this literature because they are accustomed to and excited about interdisciplinary work, have well-developed techniques to model spillovers and spatial heterogeneity, and can contribute to improving the way the country's environmental and adaptation strategies are designed.

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*Sandy Dall'erba is Associate Professor and Director of Regional Economics and Spatial Modeling Laboratory at the University of Arizona.*



## Member Profile: Carlianne Patrick, Georgia State University

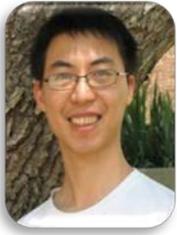
As a researcher and practitioner, Dr. Carlianne Patrick has spent her young career thinking about the uneven distribution of economic outcomes. Completing graduate studies at the London School of Economics at age twenty, she sought “real world” and life experience with which to ground her research and accepted a position at a non-profit economic development organization.

The perspectives and institutional knowledge gained through her work with policy-makers and firms significantly influenced her doctoral studies at The Ohio State University and her research agenda. Dr. Patrick’s research investigates the roles of economic development policies, agglomeration externalities, and local governments in shaping the spatial distribution of economic activity.

One strand of her research focuses on the primary state and local economic development strategy in the US – attracting firms with economic development incentives. The practice induces jurisdictions to compete with one another by offering incentives packages to firms considering location within their borders. The biggest prize in the competition for firms is the successful attraction of a large facility. Dr. Patrick studies interjurisdictional competition for the location of a single firm as well as the economic development effects of successfully winning the competition for a large new facility. She is currently investigating the economic theories underlying large firm attraction policies with empirical work on the shape of the agglomeration function and multiple equilibria associated with large, positive shocks to local industrial structure. Economic development incentives packages are bundles of tax and non-tax incentives, often with non-tax incentives comprising a considerable share. Her research considers the effects of relatively understudied non-tax incentives, which effectively subsidize capital, on local job creation, firm capital-labor substitution, and local industry composition.

Dr. Patrick also currently has projects investigating demand for alternative local public good provision and capitalization into property values; generation and reception of agglomeration externalities in markets characterized by large informal sectors; the influence of individual and local characteristics on women’s labor market decisions; and sorting associated with local tax policies.

Dr. Carlianne Patrick is an assistant professor in the Department of Economics at the Andrew Young School of Policy Studies at Georgia State University. She serves on the Executive Council of the Southern Regional Science Association, as an ex-officio member of the North American Regional Science Council, and as Chair of Graduate Student Initiatives for the National Tax Association. She is a recipient of the Andrew Young School of Policy Studies Dean’s Early Career Award, Charles M. Tiebout Prize in Regional Science, Barry M. Moriarty Prize, W.E. Upjohn Foundation Early Career Award, and the 2012 Regional Science Association International Dissertation Award.



## Member Profile: Haifeng (Felix) Liao, University of Idaho

Haifeng (Felix) Liao is currently an Assistant Professor in the Department of Geography at the University of Idaho. Felix earned his doctorate in Geography from University of Utah in 2014, following his master study of Geography from the University of Hong Kong in 2008. Felix is a broadly trained human geographer and a spatial social scientist. His primary areas of interest are development, globalization and transnational corporations, land use and transportation. From a methodological perspective, he is actively working on GIS spatial analysis and the role that space and scale play in analyzing regional inequality and convergence. He has authored or co-authored pieces in the *Annals of Regional Science*, *Environment and Planning C*, *Applied Geography*, *Stochastic Environmental Research and Risk Assessment*, and *Urban Studies*. In the future, Felix intends to continue his work in regional development, economic globalization, and human-environment interactions.

One project that Felix has been heavily involved in is “Managing Idaho’s Landscapes for Ecosystem Services (MILES)” funded by the NSF EPSCoR program. The project is to advance the understanding of feedbacks between social and ecological systems in Idaho’s mid-size cities in the face of climate change and urban growth. As part of the research team, Felix has helped to evaluate the impact of water quality on lakefront property values in the city of Coeur d’Alene in northern Idaho. In addition to academic research, Felix also worked as a Research Officer in a leading think tank (One Country Two Systems Research Institute) in Hong Kong during 2007-2009.

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## NARSC Members’ Recent Grant Awards

### **Daniel Griffith, Yongwan Chun, and David Wong win \$866,760 NIH Grant**

#### **Title: “Uncertainty in Spatial Data: Identification, Visualization, and Utilization”**

Investigators: Daniel A. Griffith, University of Texas at Dallas; Yongwan Chun, University of Texas at Dallas; David Wong, George Mason University.

Summary: This project focuses on documenting, visualizing and utilizing data uncertainty information in spatial analysis. Geocoding health outcomes of individual respondents almost always requires aggregation, either geographically or categorically, in order to preserve privacy when publishing disease rates. Features experience spatial aggregation encounter errors introduced through the processes that are not documented, and data users are not aware of the magnitude of error in a given dataset. Given data quality information is becoming more readily available, this project seeks to more easily incorporate it into the mapping environment in order to inform users and map readers of the affiliated data quality.

**Bo Beaulieu, Michael Delgado, Raymond Florax, and Brigitte Waldorf win \$300,000 USDA Grant****Title: “Resilience to the Intergenerational Transmission of Poverty”**

Investigators: Bo Beaulieu, Purdue University; Michael Delgado, Purdue University; Raymond Florax, Purdue University; Brigitte Waldorf, Purdue University.

Summary: The Space, Health and Population Economics (SHaPE) research group of the Department of Agricultural Economics at Purdue University, the Purdue Center for Regional Development (PCRD), and the Economic Research Service/United States Department of Agriculture (USDA) join forces to examine intergenerational socio-economic mobility, with a prime focus on the processes and factors that trigger a way out of poverty and resilience to the inter-generational transfer of poverty. The inter-generational transfer of poverty refers to the private and public transfer of deficits in assets and resources from one generation to another. Resilience is a concept used to examine the ways in which some individuals are able to interrupt or overcome the negative impacts of poverty and prevent its persistence within families and across generations. The Purdue research team will connect its spatial economics and econometrics expertise (through SHaPE) with large data capabilities (through PCRD), with the extensive adult and poverty research of ERS.

**Sandy Dall’erba, Francina Dominguez, George Frisvold win \$298,159 USDA Grant****Title: “The Economic Impact of Climate Change on US Agriculture – Towards More Comprehensive Estimations”**

Investigators: Sandy Dall’erba, University of Arizona; Francina Dominguez, University of Arizona; George Frisvold, University of Arizona.

Summary: Natural disasters cost billions of dollars every year to the US agricultural sector. As such, improving the accuracy of the economic impact estimates of climate change is needed. Building upon Ricardian models that account for farmers’ adaptation, this research offers a spatial econometric framework that explicitly accounts for various types of spillover effects in climate and farming data, and complements previous measurements with results based on hierarchical models and geographically weighted regressions in order to highlight the nonstationarity of the adaptation process. In addition, we investigate the role of a set of federally-supported farm programs on supporting or hindering adaptation.

## Job Announcements

### **Assistant/Associate Research Professor, Drexel University**

Drexel University was founded in Philadelphia in 1891 to provide educational opportunities for women and men of all backgrounds. Now, as a comprehensive research university with over 26,000 students across its 15 colleges and schools, Drexel's strength in co-operative education, experiential learning, and translational research provides its students and faculty with excellent opportunities for career success. Known for innovation and dramatic growth, Drexel has earned top rankings from U.S. News & World Report, appearing among its Top 100 National Universities for the past seven years and on its Best Colleges list for the past 11 years.

**Job Overview:** The Center for Spatial Analytics and Geocomputation at Drexel University is seeking outstanding candidates for openings as Assistant/Associate Research Professor. The College of Computing & Informatics (CCI) is highly interdisciplinary, focusing on basic and applied research spanning information technologies, intelligent systems, visualization, simulation and data analytics. We are seeking candidates with research, development and/or programmatic experience in spatial analytics, geocomputation, remote sensing, spatial decision support systems, open-source geocomputation, high performance and cloud computing.

**Qualifications:** Preferred applicants will have a Ph.D. in Geographic Information Science, Computer Science, Remote Sensing, Mathematics, Statistics, Physics, or related engineering disciplines. Applicants with experience in implementing solutions to support planning and substantive geographic issues are of particular interest. Salaries are competitive and based on the applicant's level of experience. Modest travel is required, including program review meetings and sponsor review meetings. Note: U.S. Citizenship is required for some positions based on the grant and certain positions may require a comprehensive security screening including a NACLC investigation.

Successful candidates will have some combination of the below skills:

Demonstrated success in working across academic disciplines with senior administrative staff at the school, college and university levels.

- High performance computing and/or cloud computing.
- Remote sensing (satellite, areal platform and UAVs).
- Real-time data collection and processing to support urban and regional planning and analysis.
- Spatial and temporal statistics.
- Open source geocomputation and spatial decision support system development.
- Educational or work background in geographic information science, computing science, and/or information science, statistics, physics and engineering.
- Comfortable working independently and with research teams while developing code in a timely manner; organized, attention to details, team-oriented, self-motivated, result-oriented and highly committed with strong communication skills.
- Proven record of external grant and research success.

Essential Functions:

- Design, implement and test spatial information systems,
- Write software, documentation and technical papers to meet sponsor requirements and deliverables
- Assist with federal and contract-based research; grant research and grant writing.

**Supplementary Posting Information:**

This position is supported fully or partially by external funding and continuation of the position is contingent on receipt of those external funds.

The College of Computing and Informatics (CCI) view of information is broad, multidisciplinary, and practical. The College continues to evolve as an innovative leader in educating information professionals in the twenty-first century, combining high quality teaching and research in a broad, multidisciplinary, and collaborative environment. CCI has numerous basic and applied research projects. Sponsors include National Science Foundation, the Institute for Library and Museum Services and a variety of other organizations, including: Lockheed Martin, Science Applications International Corporation (SAIC), Defense Advanced Research Project Agency (DARPA), Advanced Research and Development Activity (ARDA), National Security Agency (NSA), Telcordia Technologies, MIT Lincoln Labs, Office of Naval Research (ONR) , Defense Information Systems Agency (DISA), Naval Research Lab (NRL), US Army---CERDEC, and the Federal Aviation Administration (FAA).

Drexel University offers an attractive benefits package including tuition remission, a generous retirement package with matching funds (up to 9 percent) and an opportunity to join a talented team of professionals directly helping the University achieve its record growth and quality reputation.

Drexel University is an Equal Opportunity/Affirmative Action employer, welcomes individuals from diverse backgrounds and perspectives, and believes that an inclusive and respectful environment enriches the University community and the educational and employment experience of its members. The University prohibits discrimination against individuals on the basis of race, color, national origin, religion, sex, sexual orientation, disability, age, status as a veteran or special disabled veteran, gender identity or expression, genetic information, pregnancy, childbirth or related medical conditions and any other prohibited characteristic. Please visit our website to view all University Policies and Workplace Postings.

Background investigations are required for all new hires as a condition of employment, after the job offer is made. Employment will be contingent upon the University's acceptance of the results of the background investigation.

For more information about Drexel University, please visit <https://www.drexel.edu>

**To keep up with other new job openings and other breaking opportunities please visit the News and Announcement section of the NARSC website - [http://www.narsc.org/newsite/?page\\_id=417](http://www.narsc.org/newsite/?page_id=417).**