

## FEATURE ARTICLE

## ENHANCING INSTITUTIONS AND RESEARCH THROUGH HUMAN DIVERSITY: REFLECTIONS ON DIVERSITY, INCLUSION, AND THE FUTURE OF PLANT AND NATURAL RESOURCE SCIENCES<sup>1</sup>

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### ABSTRACT

Many research institutions and professional societies are looking to enhance the diversity of their members, employees, and scientists. To do this, their efforts often focus on recruitment and retention of minority employees and employees from protected classes (e.g., race, religion, sex, age); however, recruitment and retention efforts can prove difficult and do not capture the full potential of increasing institutional diversity. In this essay, I discuss how we can foster human diversity and improve our research simultaneously. Based on the literature and personal experiences, I suggest that increasing diversity is crucial to improving the capacity of our institutions to provide service to others. For this reason institutions should make diversity a core part of their missions.

**Key Words:** diversity; human diversity; inclusion; institutional missions; science research; service

*Human diversity, inclusion, equity, difference, campus climate, cultural transformation, inclusive excellence...* these are all words that have been used by individuals and institutions to address disparities in scholastic achievement, health outcomes, social and economic status, and the composition of our institutions. People view these words from many different perspectives. Some of us view them as civil rights issues. Some view them as irrelevant for a modern day merit-based society. Still others view them as important issues for our institutions to tackle. Oftentimes I hear

people either reject diversity or promote diversity “for diversity’s sake.” No matter how we view these words, everyone is affected by them. In this essay I use personal experiences and relevant literature to suggest that promoting and increasing diversity is a crucial ingredient to improving the capacity of our institutions to provide service to others. I then show that for this reason institutions should make diversity a core part of their mission. This essay is based on a panel presentation I gave at the Edward A. Bouchet Graduate Honor Society meeting at Yale University in 2011 and a keynote presentation I gave at the Botany 2014 Enhancing Scientist Diversity in Plant Biology Luncheon in Boise, ID.

Over the course of my career I have cared deeply about collaboration and the inclusion of multiple perspectives in my work. As a US Peace Corps volunteer in Bolivia in the late 1990s, I saw firsthand how multiple perspectives could come together through collaborative planning for a public/private protected area bordering a national park. When working as the assistant forest planner for the Green Mountain and Finger Lakes National Forests in the early 2000s, I worked with a team to revise the national forest plans based on the premise of collaboration, shared learning, and inclusion. In both these planning processes, we believed that the greater the number of perspectives we could get to the table to discuss the issues and possible solutions for forest management, the better forest management plans we could develop. We strove not only to include different voices in the discussion, but we provided different opportunities for involvement. Collaboration and inclusion were core principles of our projects and were deliberately incorporated throughout the entire planning process.

More recently, I have been reflecting upon the value of diversity and inclusion for scientific research. As a member of the Citizen Potawatomi Nation, one of the 566 federally recognized American Indian tribes in the United States, I have been acutely aware of the lack of tribal voices in many research projects, formal education, and our institutions (for the entire list of federally recognized tribes, see Department of Interior [2014]). When I was studying ecology in the early 1990s, it was not uncommon for scientists to view historical tribal influences upon the land and forest resources as minimal. Debates over the amount of influence tribes had on forest and ecosystem structure before the United States was founded would devolve into

discussions about historical human population numbers. More people, according to many researchers at the time, equaled more impact and fewer people meant less impact. Because I studied forestry and ecology, these discussions often revolved around fire. As a student, I remember thinking, “How many people does it take to start a large forest fire?” For me, debates about American Indian historical population sizes did not focus on the right question. The right question was how did and how do tribal people think about their relationship to the land and what do those cultural values mean for land management now and in the past. In the early and mid-1990s it felt like my perspective was in the minority. Today, there are many people asking these broader questions and we are better off as a scientific community because of it. While not new to American Indian communities, Traditional Ecological Knowledge is now an accepted and growing area of innovative and inclusive research (see Pierotti and Wildcat, 2000; Berkes, 2012; Kimmerer, 2013; Emery et al., 2014; Whyte, 2014 for some recent examples). These personal experiences illustrate the power of incorporating a diversity of perspectives into our research. Different perspectives allow us to ask novel questions and gain new insights.

So, why is diversity and inclusion important for our institutions and for science? For one thing, our country is diverse and changing. According to US Census Bureau estimates, the 2015 US population is around 321 million people; 50.7% female; 61.7% white non-Hispanic; 17.7% Hispanic; 13.2% Black; 5.5% Asian; and 1.5% American Indian/Alaskan Native/Native Hawaiian (US Census Bureau, 2014). In other words, the non-white and Hispanic population today is about 38% of the US population and is expected to grow in the next several decades to the point where white non-Hispanics are projected to comprise less than 50% of the population by 2045 (US Census Bureau, 2014). These are important trends for our society, universities, public institutions, scientific research, and for the plant sciences and natural resources. These demographic shifts will change what people expect from our institutions, how people think about natural resources, what their goals are for natural resource management, and their views on what are our most pressing research problems and how to solve them.

At the same time, our society is becoming more globalized. Not only are there people from every

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corner of the world living in the United States, but our environmental and social problems have become global in nature. Climate change and biodiversity loss are both global processes. Solutions to global problems require multiple perspectives to develop solutions. Climate change, loss of biodiversity, and erosion of social cohesion are all issues that we must solve together. They can only be solved with the support of inclusive research. Furthermore, these global problems are complex historically, socially, economically, institutionally, and ecologically, and they require diverse interdisciplinary teams to come up with innovative solutions. The inclusion of social and citizen scientists within a plant science research team can approach these challenges more effectively, as no one discipline can solve these wicked problems and no one perspective can either (see Rittel and Webber, 1973; Brown, Harris, and Russell, 2010; Thompson and Whyte, 2012).

These experiences and literature show us that diversity and inclusion can improve an institution's capacity to provide service to others. Research in particular can be understood as service. I am Potawatomi, a product of land grant universities, and a public servant. I see research as service. To me, service is a way to bring our scholarship, leadership, and advocacy together. Why do we research what we do? Why do we work on the subjects we do? For me, it has to do with service. Research for many is a calling to find answers to some of the most complex issues of our time. Research is enhanced by bringing distinct perspectives together to develop research questions, methods, analysis, and dissemination. Only when our research is of interest to diverse communities will we achieve truly groundbreaking results and interpretations to solve pressing complex problems. If we start to engage in research that is responsive to and guided by the needs and questions of diverse communities, we will begin to see a change in the people engaged with our institutions

and our institutions themselves. A critical mass of diverse employees within an institution is needed for this to happen, but the research also needs to be of interest to diverse communities to attract new students and employees to the pursuit. In the long run, if we work to answer questions of interest to minority communities, we will improve diversity within our own institutions and—maybe more importantly—these diverse institutions will give us new perspectives with which to solve the global environmental and social problems we face today.

I would like to share one more example to close my discussion on approaching diversity as a way to improve our institutional capacities to provide service to others. For nine years I had the privilege to be the Forest Service's liaison to the College of Menominee Nation, a tribal college located on the Menominee Reservation in Keshena, WI. The College of Menominee Nation and Forest Service have had a formal partnership since 2001 to do research and education based on sustainable forestry. Our goal is to work collaboratively with tribes and tribal communities to address tribal concerns. The partnership was specifically created outside of the USDA civil rights program. We did this, not because we did not support civil rights initiatives, but because we believed that if the partnership supported good research and education that meets tribal needs, everyone will benefit from the questions and answers.

We incorporated undergraduate students in all partnership projects. We had student interns working on the effects of Emerald Ash Borer on American Indian communities, Traditional Ecological Knowledge, climate change, and sustainable development. Students saw and worked with American Indian role models like myself who value their opinions and ideas, share values, and respect them. This partnership provided an opportunity for American Indian students to see that research and education can benefit them and their communities. Some students never thought that they could get a college degree or go to graduate school as a way to support their families and community. After their internships many students continued on with their educations and are now in positions of leadership throughout their tribal communities and beyond. This partnership shows that projects that embrace inclusion as a way to produce better results, address minority concerns from minority perspectives, and include minority students, faculty, and staff can create

positive feedback loops that will simultaneously improve our research, our institutions, and our communities.

As this example shows, service can be a way to improve our research and management of natural resources and a way to increase the diversity within the Forest Service and professional societies. Service is listening to the community and using our expertise to answer questions of interest to them. Service is mentoring students. Service is engaging communities collaboratively. Service is teaching. When diversity and service are approached in this manner, students and communities become involved when they see scientists working on interesting projects that will have impacts within their communities. Some students will go on for more schooling and advanced degrees. Eventually these students enter into the tribal, Forest Service, or university work force where they become role models for others and the cycle continues.

All of these examples and research imply that institutions are strengthened by viewing diversity and inclusion as a core part of their mission. Scott Page (2008) argues that “[w]e should look at diversity as something that can improve performance, not as something that we have to be concerned about so that we don't get sued” (p. xxii). I would add that we should look at diversity as something that can help us achieve our core research, education, and land management missions. All too often diversity initiatives started by federal agencies, university campuses, and private industries focus on recruitment and retention---as if numbers of people add up to a diverse, welcoming, and inclusive environment. Furthermore, even if recruitment of diverse candidates is successful, retention and overall organizational performance may not improve if institutions do not view diversity as a means to achieve their mission.

This is beginning to change, however, as businesses have begun to make strong cases for diversity as a core part of their missions. While diversity is difficult to research within companies, some scholars argue that diversity provides an opportunity to learn better how to achieve a company's mission (Kochan et al., 2003). Some studies show that diversity can increase a company's revenue, market share, customer base, and creativity and innovation (Robinson and Dechant, 1997; Herring, 2009). Additionally, a whole new phrase has grown up from work on diversity, inclusion, and big-data—the wisdom of crowds—that argues,

among other things, that cognitive diversity facilitates better decision making by expanding the range of possible solutions to problems (Surowiecki, 2005).

Researchers have also been making a strong case for including diversity as a core part of the mission of the academy. Books and academic journals such as the *Journal of Diversity in Higher Education* are devoted to the subject. Journals have devoted special issues and individual articles to the topic (e.g., Uriarte et al., 2007; Allison and Schneider, 2008; Chin, 2010; Cheruvelil et al., 2014; Moss-Racusin et al., 2014). Many of these studies have shown that our research, problem solving, and outcomes can be improved with diversity, with collaborative teams, and with multiple perspectives. Diversity and inclusion are not just civil rights issues; it is imperative for us to ask the right research questions, to analyze the data from many different angles, and to develop robust solutions. In essence, research indicates that diversity, inclusion, and collaboration contribute to better science, better results, and stronger institutions.

Many of our institutions are taking these research findings seriously. Diversity and inclusion are becoming part of how we achieve our core missions and not only as a means to fulfill civil rights obligations. For example, the US Department of Agriculture and the Forest Service have embarked on a program called “cultural transformation” (<http://www.dm.usda.gov/ct.htm>). Leaders believe that they are better able to meet our mission for the public and employees by transforming the institutional culture to value and support inclusion as a way to promote a high-performance organization. Diversity is also important to the Botanical Society of America (BSA) where the issue is discussed through the Human Diversity Committee, and workshops and symposia sponsored by several sections of the Society (e.g., <http://www.botany.org/diversity/>). In addition to student travel awards provided by sections, the PLANTS (Preparing Leaders and Nurturing Tomorrow’s Scientists) program provides travel awards for undergraduates to attend conferences and a mentors program designed to increase diversity at BSA meetings and within the profession. These initiatives are all supported by research that indicates institutional leadership, funding, and mentorship programs are important strategies for increasing student, faculty, and staff diversity (Milem, Chang, and Antonio, 2005; Turner, González, and Wood, 2008; Hurtado et al.,

2009; Byars-Winston et al., 2011; Allen-Ramdiel and Campbell, 2014).

Institutions that make progress toward diversity and inclusion have leaders that support these efforts by their words, actions, and development of collaborative plans to integrate diversity into their core missions. They provide support for student, faculty, and staff mentoring; support for transdisciplinary and collaborative research; support for including diversity as a topic of research; and support for working with communities. They also provide meaningful training on inclusion, collaboration, and building high-performing teams. Our leaders have important roles to play by setting the tone and providing support for creating diverse and inclusive institutions.

Leaders cannot do this on their own; we all need to come together to learn from one another, build community around our common institutional purposes, and take time to know each other and foster connections. One way to do this is to work together to build a community—a community of support and collaboration around inclusion and high-quality research. Offering a space to openly discuss inclusion is one way to build community. Another is through mentorship programs—for students, faculty members, and scientists. For example, BSA has an excellent mentorship program that aims to have their “[m]entors work with PLANTS students and attend talks with them, introduce them to colleagues, network and generally make the meetings a welcoming place for them” ([http://www.botany.org/awards\\_grants/detail/PLANTS.php](http://www.botany.org/awards_grants/detail/PLANTS.php)). My experience at the Human Diversity Luncheon in 2014 was that students, mentors, and BSA members were all excited to learn from one another, share experiences, and build productive relationships for future research. Society members report that undergraduates involved in these programs often go on to graduate school or biological professions. BSA’s commitment to building a diverse community is exemplified through financial support for students to attend conferences, volunteer mentors, the Human Diversity Committee, Enhancing Scientist Diversity in Plant Biology Luncheon, and the PLANTS program.

In conclusion, there are several things we can do to foster diversity and inclusion within our institutions. First, we can view research as service. One way to do this is to foster collaborations with minority serving institutions—maybe institutions

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and community organizations we have not worked with in the past. Second, we can make diversity and inclusion part of our core institutional missions. This can be done by building inclusive communities within our institutions. We can develop specific plans to continue to move our institutions toward collaboration, inclusion, and interdisciplinary research. We can also provide space to share our personal experiences and support employee and student mentorship programs—particularly programs centered around research projects that are of interest to diverse communities. Finally, we need to believe that diversity and inclusion of perspectives enriches us all and that none of us can do this alone. We are living in an era where we cannot afford to leave out different perspectives. None of us can solve our unprecedented environmental and social problems alone. If we do not have diverse people with diverse perspectives within our institutions, and if we do not include diverse communities in our research, I fear we may not have the time needed to develop solutions to solve our problems. In the end, diversity affects all of us—our institutions, our communities, and our world.

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