Nexus: Networking Across the Disciplines
2022

UNIVERSITY OF NORTH CAROLINA
CHARLOTTE

COLLEGE OF
LIBERAL ARTS & SCIENCES
INTERDISCIPLINARY STUDIES

Nexus: Networking Across the Disciplines

As we seek to "foster and grow collaborations across disciplines within UNC Charlotte" (University Strategic Plan, Objective 5.1) and build on the momentum of the Top-Tier Research Commission process, faculty from different departments, programs, and colleges need structured opportunities to learn about one another's research and to brainstorm areas of mutual interest. By facilitating such networking, Nexus aims to foster the emergence of interdisciplinary research teams and support the initial stages of project development as they formulate shared research questions, consider analytical strategies, and identify potential funding sources.

The pilot Nexus program in 2022 targeted faculty in two recognized [research areas of focus and distinction](#): 1) Migration and Diaspora Studies; and 2) Climate Change and Resilience. Any faculty member working or planning to work in these areas was permitted to apply to participate in the program regardless of whether they participated in the Top-Tier Research Commission nomination process. Existing interdisciplinary teams of researchers could apply to participate if they were in the early stages of project development. Each faculty member in the Nexus program received a $1,000 stipend for participating fully in two full-day workshops in summer 2022.

After welcoming remarks at the first workshop on May 18, participants gave 60-second "lightning presentations" using just three prepared slides to introduce themselves and their research. A subsequent team building activity facilitated by staff from Venture established a climate of cooperation and collaboration. The two research clusters then engaged separately in brainstorming sessions to generate ideas for interdisciplinary research. After lunch, discussions continued at a small-group level to elaborate further on these ideas, resulting in the formation of several working groups that agreed to continue discussions over the summer.

At the second workshop on August 15, nine working groups gave 15-minute presentations about their emerging interdisciplinary projects. The projects are quite innovative, as shown by the abstracts later in this report, and include a range of research and teaching activities. Participants at the session provided valuable feedback, and groups were given the opportunity to incorporate these suggestions into their plans. At the closing session, participants identified ways in which the university can better support interdisciplinary research. Notes from that discussion and the results of a post-workshop evaluation are included later in the report.

Nexus 2022 was organized by the Office of Interdisciplinary Studies with additional support from the College of Liberal Arts & Sciences, the Cato College of Education, the American Studies Program, and the Department of Geography and Earth Sciences. The total cost of the Nexus 2022 program was approximately $30,000, most of which went to faculty stipends.

Nexus 2022 Planning Committee

Beth Whitaker	Executive Director, Office of Interdisciplinary Studies
Lan Kolano	Professor and Chair, Middle, Secondary, and K-12 Education
Pinku Mukherjee	Associate Dean for Research and Graduate Education, College of Liberal Arts & Sciences
Nicole Peterson	Associate Professor, Anthropology
Deb Thomas	Professor and Chair, Geography and Earth Sciences

Nexus 2022 Participants

College of Liberal Arts & Sciences

Yaoyao Dai	Assistant Professor	Political Science and Public Administration
Michael Ewers	Assistant Professor	Geography and Earth Sciences
V Gil-Rivas	Professor	Psychological Science
Eric Hoenes del Pinal	Assistant Professor	Religious Studies
Sara Juengst	Associate Professor	Anthropology
Tina Katsanos	Senior Lecturer	Religious Studies
Alexander Kustov	Assistant Professor	Political Science and Public Administration
Jen Langhinrichsen-Rohling, Professor		Psychological Science
Brian Magi	Associate Professor	Geography and Earth Sciences
Candace Miller	Assistant Professor	Sociology
Gregory Mixon	Professor	History
Benjamin Radford	Assistant Professor	Political Science and Public Administration
Jack Scheff	Assistant Professor	Geography and Earth Sciences
Tina Shull	Assistant Professor	History
Heather Smith	Professor	Geography and Earth Sciences
Bao-Hua Song	Associate Professor	Biological Sciences
Drew Syverson	Research Asst Prof	Geography and Earth Sciences

College of Arts + Architecture

Mona Azarbayjani	Associate Professor	Architecture
CarlosAlexis Cruz	Associate Professor	Theatre
Marek Ranis	Professor	Art and Art History

Belk College of Business

| Peter Schwarz | Professor | Economics |

College of Computing and Informatics

| Alex Dornburg | Assistant Professor | Bioinformatics and Genomics |
| Richard Allen White | Assistant Professor | Bioinformatics and Genomics |

Cato College of Education

Kristin Davin	Associate Professor	Middle, Secondary, & K12 Education
Charles Hutchison	Professor	Middle, Secondary, & K12 Education
Spencer Salas	Professor	Middle, Secondary, & K12 Education

William States Lee College of Engineering

| Yuting (Tina) Chen | Assistant Professor | Engineering Tech. & Construction Management |
| Lei Zhu | Assistant Professor | Systems Engineering and Engineering Management |

The first Nexus workshop in May 2022 led to the emergence of multiple working groups whose members continued to brainstorm and interact with each other over the summer. In August 2022, nine working groups gave presentations about their emerging interdisciplinary projects and provided the following abstracts for wider circulation. Some groups already have clear targets for grant applications, while others are open to suggestions about where to seek external funding.

Burying Futures: Archaeology of Graves to Be
Sara Juengst, Eric Hoenes del Pinal, CarlosAlexis Cruz, Charles Hutchison

One of the hallmarks of being human is mortuary ritual and symbolic burial. Well-documented in the archaeological record, humans use mortuary monuments for many purposes in addition to memorializing the dead, including the creation of sacred landscapes, the demarcation and maintenance of territory boundaries, and the reinforcement of community identities. This project will apply archaeological and anthropological theories about death, mortuary practices, and place-making to modern contexts in order to gain a better understanding about perspectives and experiences of immigration and identity. In particular, we will investigate the desires of long-term immigrants regarding their remains after death. Where do people want to be buried? Would they prefer that their remains were returned to their country of origin or their current region, and how might these preferences change over time? What can this tell us about how people's ideas about home and belonging change over time? Methods for this project include surveys and semi-structured interviews with international immigrants who work at universities in the United States and have lived in the United States for 1+ years. This project is significant as we live in an increasingly international and global society, where boundaries are ever-present. Understanding how people view belonging both in life and death can help us untangle ideas about the power of mortuary practice and the creation of "place" in modern contexts. An interdisciplinary approach is critical to this project as it merges theory and method from archaeology, anthropology, and religious studies to achieve a broadly humanistic perspective.

Education-based efforts to mitigate language loss and preserve linguistic diversity
Alex Dornburg, Kristin Davin

One of the emergent challenges of the 21st century is the preservation of biological diversity. While ecological and species diversity are often at the forefront of conservation efforts, we are now facing an unprecedented extinction crisis for a fundamental aspect of human diversity: language. Linguistic diversity has been repeatedly shown to be of extreme value for topics that span governance to policy to medicine and therapeutic discovery. Thus, the development of strategies that mitigate the loss of languages are urgently needed. Our *long-term goal* is to develop research-based strategies that can be translated into actionable approaches mitigating the

language extinction crisis. To this end we have developed three primary aims: *Aim 1. Provide a quantitative framework for effectively coordinating linguistic immersion efforts across the United States.* We will (*1.a*) construct phylogenetic trees for endangered languages present in the United States and (*1.b*) quantify the number of students in each state identified by a new language education policy (i.e., the Seal of Biliteracy) that recognizes biliterate students, enabling (**1.c**) identification of endangered languages for which this language education policy might help to preserve and which others need more targeted efforts. *Aim 2. Assess the generational impact of language revitalization efforts of 'ōlelo Hawai'i.* We will (*2.a*) perform cluster analysis on survey data from Native Hawaiians to examine how perceptions of language revitalization efforts differ across generations. We will *(2.b)* identify programmatic structures or characteristics that support language revitalization and *(2.c)* programmatic structures or characteristics that require revision or reconsideration. *Aim 3. Enhance language immersion programming of the Eastern Band of Cherokee Indians (EBCI) and train community members in genomic sequencing and data analysis.* We will (*3.a*) provide workshops based on learning in Hawaii to the EBCI to improve language revitalization efforts and (*3.b*) create a database of speaking and writing samples through these efforts to document the language. We will (*3.c*) offer a summer workshop on genomic sequencing and data analysis for the EBCI focused on evaluating organismal health and diversity of their natural resources with the goal of initiating long-term training opportunities for EBCI students and educators that can broaden their participation in STEM fields.

Climate Migration in North Carolina: Global Perspectives, Local Experiences
Heather Smith, Tina Shull, Michael Ewers, Marek Ranis, Jack Scheff

Much of the existing climate migration research focuses on international "hotspots" for climate change and displacement, such as densely populated coastal regions of South Asia or sinking island states in the Pacific. While the United States is experiencing the effects of climate change, mass climate migration is often viewed as something happening in the more distant future. However, internal climate displacements are on the rise, and at the same time, the United States is a destination for climate migrants from international locations where the impacts of climate change have become untenable. As one of the fastest-growing states in the nation with large numbers of both domestic and international migrants, and one that is threatened by climate change and local displacement, North Carolina provides a nexus for understanding both local and global climate change impacts. In particular, our research asks the following questions: 1. How do local climate perceptions interact with global climate connections; 2. How do multiple local and international climate migration dynamics converge in a single state/region; and 3. How is climate-related migration decision-making shaped by diverse forms of advantage and disadvantage? To address these questions, this project uses multiple and mixed methods to create a framework for understanding migration and climate change in an interdisciplinary way, including historical and geographical analysis, climate science, and experimental and participatory art and media. This holistic framework reveals new pathways for interdisciplinary study, and for community-based action.

How social scientists learned to stop worrying and love immigration: A big-data analysis of academic articles over the past century
Alexander Kustov, Yaoyao Dai, Benjamin J. Radford, Candace Miller

How have the scholarly views about immigration developed over the past century? A lot is known about the trajectories of immigration attitudes among ordinary people and political elites. But the attitudes of intellectual elites have so far been overlooked due to the lack of relevant data. To overcome this issue, we propose to build a comprehensive corpus of all social science articles (1900-2020, 2M) and identify those related to immigration. We will measure the changes in relevant terms, sentiments, stances, and topics associated with immigration across time and disciplines using cutting-edge text-analysis techniques. We will then use these estimates to test whether the changes in academic views are associated with the broader liberalization of immigration politics. Our approach allows us for the first time to trace a remarkable transformation of the academic discourse from the negative framing of immigration as a social/racial "problem" to its positive framing as an "opportunity." Since we aim to analyze the data from all social science articles, it is important for us to integrate the perspectives of multiple disciplines.

National Endowment for the Humanities Summer Institute
Candace Miller, Gregory Mixon

We are currently thinking of doing an Institute for K-12 focused on contemporary urban issues such as housing inequality and its impact on urban education. As a Humanities based institute for K-12 educators the proposed institute will provide participants with access to scholarly readings, curriculum development, and incorporation of scholarship in teaching. This would be an interdisciplinary institute utilizing the disciplines of Sociology, History, Africana Studies, and Literature.

Black women teachers' shape shifting portfolios
Candace Miller, Spencer Salas

Drawing from an in-depth interview sequence, this analytic narrative stories the professional trajectory of a young Black woman, Andrea Gamble, née Washington (pseudonym), and her career in education spanning nearly 20 years in three states and two coasts. Over time, Gamble slowly and deliberately accumulated and refined a broad and specific professional repertoire as a middle grades teacher, a K-8 assistant principal, and a residential life professional in higher education. Along the way, she earned a B.S. in Middle Grades Education, an M.Ed. in Educational Administration, and, at the time of his manuscript, was a semester away from her Ph.D. in Curriculum and Instruction. That said, Gamble left teaching both because "she grew out of it"— and because, quite simply, she could. Theorizing Gamble's professional choices through a lens of fugitivity, our findings suggest that longstanding metaphors for Black womanist teacher agency potentially underestimate how contemporary Black, Indigenous, and People of Color

(BIPOC) professionals organize, strategize, and enact shapeshifting portfolios as they re-imagine different ways of being and existing as educators in a neo-liberal K-12 marketplace.

Explore Traffic-related Air Pollution in Bus Stop Environments
Lei Zhu, Brian Magi, Peter Schwarz

This research aims to understand exposure to traffic-related air pollution (TRAP) in bus stop environments by developing and testing a cost-effective, comprehensive, and portable environmental monitoring system. It quantifies the key parameters of TRAP exposure. The correlation analysis fills the knowledge gap on the relationship between traffic, meteorology, and air pollutants at bus stops. We aim to address questions such as "How does the air quality at bus stops compare with the urban background air quality? How much TRAP exposure does a bus rider get while waiting at the bus stops? Are there design features of bus stops that would provide ways to reduce the average TRAP exposure? What are the net benefits of design alternatives?" The innovations of the proposed approach include: 1) Developing a cost-effective, comprehensive, and portable environment monitoring system to quantify exposure at bus stops. The system uses portable mounts with sensors and supply equipment. A LiDAR sensor monitors vehicle traffic and passenger activities. Low-cost air quality sensors measure the concentration of $PM2.5$, NO_2, and VOCs. Meteorological sensors collect ambient wind and weather data. 2) The collected comprehensive data will be used to quantify TRAP exposure and thus understand how exposure varies as a function of weather and traffic in bus stop environments. With that result, countermeasures can be generated, including electric bus deployment, bus route and stop location re-design, and enclosed or modified bus stop design. Furthermore, the effectiveness of countermeasures could be verified by using the cost-effective monitoring system that we propose to build in a simple before-and-after study design. 3) Valuing reduced exposure to pollutants as compared to the cost of bus stops policy alternatives such as improved filtering of bus stops or relocation of bus stops.

Harnessing Wild Diversity and Systems Biology to Meet Climate Change Challenge
Bao-Hua Song, Drew Syverson, Rick White

Climate change has generated various critical challenges to agriculture sustainability and food security. The development of novel crop varieties can meet these challenges with increased biotic or abiotic resistance, enabling them to thrive in changing environments. Crop wild relatives (CWRs) harbor much higher levels of genetic diversity than cultivated crops and have the potential to meet these challenges. The wild soybean (Glycine soja), the ancestor of the domesticated soybeans (Glycine max), is widely distributed throughout diverse habitats. We use wild soybean as our study system to investigate its genetic basis of climate adaptation by employing Omics, systems biology, and genome editing. We will also investigate the enhanced mineral weathering on plant growth efficiency and climate adaptation. This project will be developed for external grant applications, such as NSF Organismal Response to Climate Change (ORCC), USDA Agriculture and Food Research Initiative (AFRI), and Private Foundations

Promoting Resilience in the Context of Extreme Heat Events
Jennifer Langhinrichsen-Rohling, V. Gil-Rivas

In May of 2022, the National Academies of Sciences, Engineering, and Medicine held a virtual seminar on the consequences of climate change (i.e., extreme heat) on the health of older adults. Invited speakers included experts from the National Institute on Aging and the National Resources Defense Council. The central points made were: 1. Climate change is going to accelerate rapidly even with measures to reduce carbon and methane emissions; 2. older adults are particularly vulnerable to climate change as they tend to be less adaptable and more likely to suffer adverse health effects related to weather and disasters; 3. the mechanisms by which climate change differentially impacts the health of older adults are just now being delineated; and 4. social disadvantage and economic inequities further impact the ability of older adults to adapt to climate change yet this reality is poorly addressed among older adults and within disaster plans. Resilience in the face of these changes requires individual, family, community, and cultural responsiveness and a multilevel prevention and intervention approach. Our team is in the process of developing a study that will focus on more extreme heat as a climate change outcome that is particularly deleterious to the health (mental and physical) of older adults.

Advancing Interdisciplinary Research at UNC Charlotte
Notes from Discussion at Nexus Workshop
August 15, 2022

What do you need to advance your project? Where are you looking for opportunities? What can the university, colleges, and departments do to support your project specifically and to promote interdisciplinary research more broadly?

- Not enough money in grants with 54% F&A to buy out classes with assistantships, other grant expenses.
- More time. How to budget for course releases, assistantships in grants. But course releases are often hard to get without a grant. R1 expectations with R2 time commitments
- Lack of graduate students to hire - funding issues lead students to drop out, and undergraduates need more training. Recruitment of students is an issue. Need to build more of a culture of research assistants. Need to put in money for RAs for full lines rather than cobbled together assistantships. Growing class sizes also may be a concern but this should be separate. Can hire people not at UNC Charlotte with an external grant. Pinku requested institutional RAships. RA bank in public policy - could request one for a project through an application process similar to the one for FRGs.
- Conference funding more important for interdisciplinary research collaborations (more conferences) - travel fund can be set up? Dean's discretionary fund, department and now college is getting F&A back as another resource.
- Question - what faculty wants college F&A spent on? Publication fees (library has funds for this which college could then add to for open access journals), conference funding, others?
- Inequities in expected research budgets - social sciences smaller than natural or computer sciences; conference funding too - how can we better recognize this difference in support?
- Intercollege collaborations - how to encourage colleges to revise RPT process to respect collaborations. External letters (if disciplinary only) can miss the value of interdisciplinary work. Journals that are acceptable are also an issue - other disciplines, etc. Provost might be a good place to start discussions.
- Lecture series that are interdisciplinary - good way to keep Nexus going. Hybrid if possible. Interdisciplinary happy hour a few times a semester.
- Other interdisciplinary groups for R1 Research area focus and distinction - could be a good place to build interactions. 88 applications narrowed to 17 areas. Space of exploration here vs competitive feel of R1 process.
- Communication about brown bags and lecture series - CLAS digest is packed. Is there a place where these could be centralized and shared? Maybe a calendar?

Nexus 2022 Evaluation Results

What part(s) of the Nexus program did you find most useful? Why?
- Learning exciting interdisciplinary projects ideas and find proper experts
- Networking with colleagues from other departments (unlikely to have happened without Nexus)
- Networking and brainstorming time were crucial for finding new angles on research.
- Dedicated time to discuss and hash out interdisciplinary collaboration ideas with colleagues
- Learning about other's interests and projects and trying to figure out connections - interdisciplinary work requires trust, communication, and relationships - this process began.
- Smaller group discussions and presentations during the follow-up meeting
- network and presentations from the groups
- meeting and networking with other faculty, informal conversations, presentations and feedback from the group during the second meeting
- Meeting people in a variety of disciplines and seeing if our interests overlapped.
- Meeting new colleagues and making new connections on campus. I started in Fall of 2019, so I have missed a lot of opportunities to meet other faculty.
- Colleagues with complementary expertise had the opportunity to meet and discuss ideas and common interests.
- Sharing
- Getting to know people outside of my discipline who are interested in similar topics and open to interdisciplinary collaboration is perhaps the best part for me. The teambuilding activities were awesome as well! They really helped to make the group closer. The conclusion project report workshop was great too. It helped me to get more information on other's interests and expertise, and good early feedback on our project.
- Lightning presentations/learning who is doing what, and free time to make connections
- I enjoyed the project presentations

What part(s) of the Nexus program did you find least useful? Why?
- Team-building could have been shorter
- The administrator's presentation at the start of the May session went a bit long and didn't seem particularly geared to what we were trying to do.
- The speeches from officials, trust-building activities from UREC, long arguments about which post-it notes belonged on which board and what is the meaning of resilience, etc. during the first workshop. These were completely unnecessary and took hours of valuable time away. Just skip the filler and get to the substance please.
- The one sorting activity on the first day wasn't enough to find out about and learn connections - our group struggled.
- The presentations at the start of the first day and the break groups that occurred during the second part of the first day of the meeting.

- group brainstorming
- The afternoon of the final session. We didn't have an opportunity to talk with other research time.
- Team building at the first meeting. It felt longer than it needed to be and we didn't have enough time to work on our projects as a result.
- Break out sessions turn into moments of isolation
- The brainstorm session on the first day. Each group involved at least 8 people. The topic or focus often shifted after one or two people. It was not very productive. I did not see solid research questions after the brainstorm session, as those need extensive research & lit review.
- team-building was fun but could have been focused around our work with a goal of making connections; meeting in summer seemed a good idea but people in our group not being able to be present posed a challenge

What suggestions do you have about how to improve Nexus in the future?
- More exploratory or unstructured time would be good during the first meeting. A tighter control on presentation times in the second meeting would have been good, too.
- See above -- cut the hokey activities, dignitary speeches, etc from the first workshop and leave more time for groups to collaborate and work together substantively.
- More intentional mingling exercises - so we can be in multiple small groups early to learn and play off of each other.....
- I would move the second workshop to September so faculty would have more time to come together and plan.
- For me, I would like to see more people from social psychology/organizational sciences, if that is possible, since my research is very interdisciplinary, kind of linking construction management and organizational sciences/psychology.
- Maybe an opportunity for people to connect before the in person workshop?
- Stick more closely to the schedule. The morning of the second meeting went too long, lunch was too late, and there was not enough time for the afternoon's purpose.
- I am not sure how, but it would be great to identify teams before the first meeting. Maybe some online discussion boards to help facilitate that? This way, the actual meetings would be more focused on developing the proposal instead of creating a team.
- I think the first one this summer went very well!---very well organized and structured. Thanks for the hard work of the organizers!
- More Diaspora support
- Perhaps, we can remove the brainstorm session but add a session where each individual talk more about his/her research. I think it is most helpful for me to know other's expertise and interests, and the interdisciplinary research we might have in mind but cannot do without a collaborator from another discipline. Some informal meetups might be helpful as well. =) Sometimes research ideas just pop during informal conversations about what we do and what interests us.

- Allocating more/free time in the beginning to float, meet and greet, and forge initial connections
- The opportunity to brainstorm and workshop with others in a structured context is always valuable

Do you have any other feedback about Nexus?
- May involve more other colleges and topics (rather than two).
- I thoroughly enjoyed both sessions of Nexus. It's a shame that we seemed to drop a big chunk of people for the August one.
- No - see above. Biggest problem was time-wasting activities during the May meeting.
- Really great idea and iteration of the program.
- Regrettably, I came down with Covid shortly after the meeting and am now recovering. It was one of the first all-day indoor meetings I have attended, and in retrospect, I should have been more vigilant about masking, and perhaps it is still not time for face-to-face meetings of this type.
- You did a great job putting this together, Beth!
- I am very glad that I participated in the Nexus this summer!
- Thank you everyone who worked and are working on Nexus! I truly enjoyed it and wish it continues!
- I am grateful to be part of it and for the vision and work of the organizers!
- Great initiative and very excited to be a part of it!

Would you encourage your colleagues to participate in future Nexus workshops?

15 responses

- Yes
- Maybe
- No

13.3%

86.7%