

Samuel Norton Chambers, Ph.D.

Researcher, Zuckerman College of Public Health, The University of Arizona
Geographer, Western Geographic Science Center, U.S. Geological Survey

EDUCATIONAL CREDENTIALS

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| 2015 | Ph.D., The University of Arizona
Major: Arid Lands Resource Sciences
Minor: Urban Planning |
| 2011 | M.S., Clemson University
Major: Forest Resources |
| 2006 | B.S., The University of Idaho
Major: Forestry
Minor: Fire Ecology |

ACADEMIC APPOINTMENTS

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| 2021- | Researcher/Scientist III , Epidemiology and Biostatistics Department,
Zuckerman College of Public Health, The University of Arizona |
| 2020- | Faculty Affiliate , Binational Migration Institute, The University of Arizona |
| 2018-2021 | Research Associate , School of Geography, Development, & Environment, The
University of Arizona |
| 2018-2020 | Instructor , Arts, Sciences & Natural Resources, Haywood Community College |
| 2016-2018 | Assistant Research Professor , College of Architecture, Planning & Landscape
Architecture, The University of Arizona |
| 2016-2017 | Adjunct Instructor , College of Architecture, Planning & Landscape
Architecture, The University of Arizona |
| 2015-2016 | Postdoctoral Research Fellow , Institute of the Environment; School of
Geography & Development; Mel & Enid Zuckerman College of Public Health,
The University of Arizona |
| 2014-2015 | Graduate Teaching Associate , Geographic Information Systems Technology,
School of Geography & Development, The University of Arizona |

- 2013-2014 **Graduate Research Assistant**, School of Natural Resources & the Environment,
The University of Arizona
- 2014 **Graduate Teaching Associate**, School of Natural Resources & the Environment,
The University of Arizona
- 2013 **Graduate Teaching Assistant**, School of Natural Resources & the Environment,
The University of Arizona
- 2011-2013 **Graduate Research Assistant**, College of Architecture, Planning & Landscape
Architecture, The University of Arizona
- 2009-2011 **Graduate Teaching Assistant**, College of Agriculture, Forestry & Natural
Resources, Clemson University
- 2009 **Graduate Research Assistant**, College of Agriculture, Forestry & Natural
Resources, Clemson University
- 2006 **Research Assistant**, College of Natural Resources, The University of Idaho

PROFESSIONAL APPOINTMENTS

- 2022- **Investigator**, Border Forensics, Geneva, Switzerland
- 2020- **Geographer**, Western Geographic Science Center, U.S. Geological Survey
- 2017-2018 **GIS Specialist**, Arizona State Museum

PUBLICATIONS

PEER REVIEWED:

Chambers, S.N., Brown, H.E., Keith, L., Austhof, E., Application of the Geographic Human Heat Balance Equation to Public Health in the Arizona Urban Sun Corridor. *Remote Sensing Applications: Society and Environment*

Chambers, S.N., Boyce, G.A., Martínez, D.E., Bongers, C.C.W.G. Keith, L., 2023. The contribution of physical exertion to heat-related illness and death in the Arizona borderlands. *Spatial and Spatio-temporal Epidemiology*, 46(2023), p.100590.

McNellis, B.E., Knight, A.C., Nauman, T.W., **Chambers, S.N.**, Brungard, C.W., Fick, S.E., Livensperger, C.G., Borthwick, S. and Duniway, M.C., 2023. Livestock

removal increases plant cover across a heterogeneous dryland landscape on the Colorado Plateau. *Environmental Research Letters*, 18(3), p.034034.

Chambers, S.N., Villarreal, M.L., Norman, L.M., Bravo, J.C. and Traphagen, M.B., 2022. Spatial models of jaguar energy expenditure in response to border wall construction and remediation, *Frontiers in Conservation Science*, p.114.

Chambers, S.N., Villarreal, M.L., Duane, O., Munson, S.M. Stuber, E., Tyree, G., Waller, E.K., Duniway, M.C., 2022. Conflict of Energies: Spatially Modeling Mule Deer Caloric Expenditure in Response to Oil and Gas Development, *Landscape Ecology*, 37(11), pp.2947-2961.

Chambers, S.N., Miranker, M., 2022. Dehydration Rate and a Novel Model to Aid Search and Relief for Undocumented Border Crossers in the Sonoran Desert. *The Professional Geographer*, 74(4), pp.642-658.

Chambers, S.N., Martínez, D.E., Boyce, G.A., 2022. Climate Impact or Policy Choice? The Spatiotemporality of Thermoregulation and Border Crosser Mortality in Southern Arizona. *The Geographical Journal*, 188(3), pp.401-414. (Featured in Climate Changed Geographies Virtual Issue, RGS-IBG Annual Conference 2023)

Chambers, S.N., Boyce, G.A., Launius, S. and Dinsmore, A., 2021. Mortality, Surveillance, and the Tertiary “Funnel Effect” on the US-Mexico Border: A Geospatial Modeling of the Geography of Deterrence. *Journal of Borderlands Studies*, pp.1-26.

Chambers., S.N., Boyce., G.A., Jacobs, W.J. 2021. Constructing a Desert Labyrinth: The Psychological and Emotional Geographies of Deterrence Strategy on the U.S. / Mexico Border. *Emotion, Space and Society*, 38, p.100764.

Boyce., G.A., **Chambers, S.N.,** 2021. The Corral Apparatus and the Architecture of Death and Deterrence on the United States / Mexico Border. *Geoforum*, 120, pp.1-13.

Chambers, S.N., McMahan, B., Bongers, C. 2020. Developing a Geospatial Measure of Change in Core Temperature for Migrating Persons in the Mexico-U.S. Border Region. *Spatial and Spatio-temporal Epidemiology*, 35, p.100363.

Chambers, S.N. 2020. The Spatiotemporal Forming of a State of Exception: Repurposing Hot-Spot Analysis to Map Bare Life in Southern Arizona’s Borderlands. *Geojournal*, 85(5), pp.1373-1384.

Boyce, G.A., **Chambers, S.N.,** Launius, S., 2019. Bodily Inertia and the Weaponization of the Sonoran Desert in United States Boundary Enforcement: A GIS Modeling of

Migration Routes through Arizona's Altar Valley. *Journal on Migration and Human Security*, 7(1), pp. 23-35.

Gentry, B., Boyce, G.A., Garcia, J., **Chambers, S.N.**, 2019. Indigenous Survival and Settler Colonial Dispossession on the Mexican Frontier: The Case of Cedag Wahia and Wo'oson O'odham Indigenous Communities. *Journal of Latin American Geography*, 18(1), pp. 65-93.

Curran, K.M., Nelson, A.C. and **Chambers, S.N.**, 2019. A Framework to Operationalize a Deep and Vast Literature for Practice: Translating Land Value Uplift Literature to Estimate Economic Impacts of Multimodal Transportation System Projects. *Transportation Research Record*, 2673(8), pp.62-72.

Chambers, S.N., Tabor, J.A., 2018. Remotely identifying potential vector habitat in areas of refugee and displaced person populations due to the Syrian civil war. *Geospatial Health*, 13(670), pp. 276-280.

Chambers, S.N., Jacobs, W.J., Lindberg, C., 2018. Maze or Labyrinth: Identifying PTSD Stressors in the Built Space of Refugee Camps. *The Professional Geographer*, 70(4), pp.552-565

Chambers, S.N., Baldwin, R.F., Baldwin, E.D., Bridges, W.C. and Fouch, N., 2017. Social and spatial relationships driving landowner attitudes towards aquatic conservation in a Piedmont-Blue Ridge landscape. *Heliyon*, 3(4), p.e00288.

IN REVIEW:

Watkins, L., Brown, H.E., Keith, L., Austhof, Cox, H.L., Tabor, J., Gettel, A., **Chambers, S.N.**, Spatial Optimization of Cooling Centers in Maricopa and Pima Counties, AZ (*Environmental Health Perspectives*)

PUBLIC SCHOLARSHIP:

Heller, C., Pezzani, L., Tchilouta, R.A., Plath, T., Reder, G., **Chambers, S.N.**, Michel, S., Padeletti, R., Iseles, J., Kretzschmar, J., Saint-Saens, I., Zekriti, C., Campergue, M., Smith, A., 2023. Mission accomplished? The deadly effects of border control in Niger. *Border Forensics*.

Gentry, B., Daukei, R., Sotelo, L., **Chambers, S.N.**, 2023. Out of Sight, Out of Mind; a Human Rights Report on Border Violence under MPP and Title 42. *Indigenous Alliance Without Borders (Alianza Indigena Sin Fronteras)*, *UCLA Center for Mexican Studies*, and *UCLA Latin American Institute*.

Boyce, G. & **Chambers, S.**, 2022. Opinion | Robotic dogs patrolling the U.S. border will not stop migrants but they may lead to more deaths. *The Washington Post*, Washington, DC, 22 February 2022.

Chambers, S.N., Brown, H.E., Keith, L., Austhof, E. 2022. Summary of Heat Exposure Layer Development. A Report for the Arizona CDC Building Resilience Against Climate Effects (BRACE) project.

Martínez, D.E., Reineke, R.C., Boyce, G.A., Anderson, B.E., Hess, G.L., Parks, B.O., Vogelsberg, C.C.M., Vollner, J.M., **Chambers, S.N.**, Launius, S., Soto, G., Kreyche, M., Rubio-Goldsmith, R., 2021. Migrant Deaths in Southern Arizona: Recovered Undocumented Border Crosser Remains Investigated by the Pima County Office of the Medical Examiner, 1990-2020. *Binational Migration Institute*.

American Civil Liberties Union., 2021. The Border's Long Shadow: How Border Patrol Uses Racial Profiling and Local and State Police to Instill Fear in Michigan's Immigrant Communities.

No More Deaths., Coalición de Derechos Humanos., 2021. Left to Die: Border Patrol, Search and Rescue, and the Crisis of Disappearance.

Boyce, G.A., **Chambers, S.N.**, & Launius, S., 2019. Smart border technology is not a humane alternative to the wall. *The Hill*, Washington, DC, 11 February 2019.

No More Deaths., Coalición de Derechos Humanos., 2017. The Disappeared Report Part II, Interference with Humanitarian Aid: Death and Disappearance on the US–Mexico Border.

Brown, H.E., Roach, M. Smith, G.R., Wilder, M., **Chambers, S.N.**, Patten, I.E., Rabby, Q., 2016. Assessment of Climate and Health Impacts on Vector-Borne Diseases and Valley Fever in Arizona: Building Resilience against Climate Effects: Vulnerability Assessment. *Arizona Department of Health Services*.

Perkl, R.M., **Chambers, S.N.**, Smith, G.R., 2013. Arizona Landscape Integrity and Wildlife Connectivity Assessment. *The University of Arizona and the Arizona Department of Game and Fish*.

GUEST LECTURES/LABS

Schamberger, K., Heller, C., Tchilouta, R.A., Reder, G., **Chambers, S.N.**, Michel, S., Iseles, J., 2023. Mapping the Deadly Effects of Border Control in Niger. Medico International, Frankfurt am Main, Germany. Virtual. 15 June 2023.

Chambers, S.N., 2023. Geographically Weighted Regression in Epidemiology and Biostatistics. Department of Epidemiology & Biostatistics, University of Arizona, Tucson, AZ. 11 April 2023.

Chambers, S.N., 2022. Mapping Migrant Mortality Patterns and the Physiological Consequences of Border Policy in the Sonoran Desert, *Border Forensics Program*. School of Architecture, Civil and Environmental Engineering, Swiss Federal Institute of Technology, Lausanne, Switzerland. Virtual. 23 March 2022, 30 March 2022.

Miller, T., Aizeki, M., Boyce, G.A., **Chambers, S.N.**, Phippen, J.W., 2022. Panel discussion, *Smart Borders*. The Border Chronicle, Virtual. 27 January 2022.

Bemmis, J., Molomot, L., Boyce, G.A., **Chambers, S.N.**, Martínez, D.E., Reineke, R.C., 2021. Panel discussion, *Missing in Brooks County*. University of Arizona School of Theater, Film, and Television, The Loft Cinema, Tucson, AZ. 10 September 2021.

Chambers, S.N., Launius, S., Boyce, G.A., 2021. Using Geospatial Analysis and Remote Sensing to Document the Effects of Border Control, *Border Forensics Workshop*. Bard College, Annandale-On-Hudson, NY. Virtual. 5 July 2021.

Chambers, S.N., 2021. Infrastructures of Deterrence and the Geography of Migrant Deaths in the Arizona Desert, *Migration Dialogues Panel on Migrant Deaths*. Binational Migration Institute, Department of Mexican American Studies, University of Arizona, Tucson, AZ. 27 April 2021.

Chambers, S.N., 2019. Geospatially Modeling Energy Expenditure and Biological Stress, *Paul Burton Seminar Series*. Department of Biology, Western Carolina University, Cullowhee, NC. 25 October 2019.

CONFERENCES

Chambers, S.N., Martínez, D.E., Boyce, G.A., Bongers, C.C.W.G., Keith, L., 2021. Heat-Related Death as a Function of Physical Exertion and Border Policy in Southern Arizona. Presented at: *2023 International Congress of Biometeorology*. Mesa, AZ. 16 May 2023.

Chambers, S.N., Villarreal, M.L., Duane, O., Munson, S.M., Tyree, G., Waller, E.K., Duniway, M.C., Mapping and Quantifying Change in Ecosystem Services from Oil and Gas Development on the Colorado Plateau. Presented at: *2023 IALE-North America Annual Meeting*. Riverside, CA. 22 March 2023.

Duniway, M.C., Mann, R., Lupardus, R., Haines, S.S., Bradford, J., **Chambers, S.N.**, Munson, S., Reed, S., Varela, B.A., Villarreal, M. The importance of native seeds for reclamation of energy-impacted landscapes on the Colorado Plateau. Presented at *Native Seed Conference*. Washington, DC. 27 March 2023.

Chambers, S.N., Villarreal, M.L., Duane, O., Munson, S.M. Stuber, E., Tyreel, G., Waller, E.K., Duniway, M.C., Energy costs energy: a geospatial model of mule deer caloric expenditure in response to oil and gas development in the Colorado Plateau. Presented at: *16th Biennial Conference of Science & Management on the Colorado Plateau*. Flagstaff, AZ. 14 September 2022.

McNellis, B.E., Knight, A.K., Nauman, T.W., **Chambers, S.N.**, Brungard, C.W., Fick, S.E., Livensperger, C.G., Borthwick, S., Duniway, M.C., Climate and soils moderate land cover change following grazing retirement in Capitol Reef National Park. Presented at: *16th Biennial Conference of Science & Management on the Colorado Plateau*. Flagstaff, AZ. 13 September 2022.

Chambers, S.N., Villarreal, M.L., Norman, L., Culver, M., Carlos Bravo, J., Traphagen, M., 2021. Can Jaguars Expend the Effort to Traverse New Border Construction? Presented at: *North American Regional Association of the International Association for Landscape Ecology-Annual Meeting*. Virtual. 13 April 2022.

Chambers, S.N., Martínez, D.E., Boyce, G.A., 2021. Climate or Enforcement? The Spatiotemporality of Border Crosser Mortality and Thermoregulation in Southern Arizona [Geographies of the Missing and Disappeared]. Presented at: *American Association of Geographers Annual Meeting 2022*. Virtual. 25 February 2022.

Chambers, S.N. Border technology for human deprivation [National Security? The Border militarization industry's birth at the US Southwestern Border] Presented at: *Association of Academic Programs in Latin America and the Caribbean 33rd Annual Conference: Cultural Awareness and Social Justice*. Tucson, AZ. 17 February 2022.

Chambers, S.N., Martínez, D.E., Boyce, G.A., 2021. Climate or Border Policy? A Forensic Analysis of Heat Stress Over Space and Time in Arizona. Poster presented at: *Place & Health 2021*. Virtual. 16 November 2021.

Chambers, S.N., Villarreal, M.L., Duniway, M., 2021. Conflict of Energies: Projecting a Landscape's Caloric Expenditure for Mule Deer in Response to Oil and Gas Energy Development. *North American Regional Association of the International Association for Landscape Ecology-Annual Meeting*. Virtual. 14 April 2021.

Chambers, S.N., Perkl, R.M., Marsh, S., Gimblett, R., Pivo, G., de Steiguer, E., 2013.
Developing a New Conservation Decision Making Tool: Combining a Social Index
with Connectivity Models. *12th Biennial Conference of Science & Management on
the Colorado Plateau*. Flagstaff, AZ. 17 September 2013.

EXHIBITS

Pezzani, L., Andritsou, D., Badano, R., Boyce, G.A., **Chambers, S.N.**, Launius, S.,
Guarnieri, L., James, T., Joyes, T., Khan, F.A., Levidis, S., Plath, T., Preusse, R.,
Rullmann, H., Tazzioli, M., Varma, A., *Hostile Environment(s)*, Ar/ge Kunst Gallery
Museum, Bolzano, Italy, 21 November 2019-2 August 2020.

Pezzani, L., Andritsou, D., Badano, R., Boyce, G.A., **Chambers, S.N.**, Launius, S.,
Guarnieri, L., James, T., Joyes, T., Khan, F.A., Levidis, S., Plath, T., Preusse, R.,
Rullmann, H., Tazzioli, M., Varma, A., *Hostile Environment(s)*, Z33
Kunstencentrum, Hasselt, Belgium, 6 March 2021-16 May 2021.

REVIEWER

2023	Environment and Planning B: Urban Analytics and City Science , SAGE Publications
2022	Canadian Journal of Civil Engineering , Canadian Science Publishing
2022	Science of the Total Environment , Elsevier Journals
2021 - 2022	Journal of Borderlands Studies , Routledge Journals
2021	Journal of Environmental Management , Elsevier Journals
2021	Applied Geography , Elsevier Journals
2020	Population, Space and Place , Wiley Journals
2020	Climatic Change , Springer Journals
2020	Geojournal , Springer Journals
2020	Journal of Transport Geography , Elsevier Journals

SERVICE

- 2020-2021 **Spatial Analyst**, ACLU - Michigan, Detroit, MI
- 2016- **Abuse Documentation**, No More Deaths, Tucson, AZ
- 2016- **Abuse Documentation**, Coalición de Derechos Humanos, Tucson, AZ
- 2016-2017 **Cartographer**, Tohono O'odham Nation, Sonora, Mexico
- 2015 **Guest Teacher: Pre-K Spatial Skills**, St. Alban's Preschool, Tucson, AZ

MEDIA COVERAGE

Grillmeier, F., Fallon, K., Haiges, V., 2023. Disappeared in the desert: bodies lie in the sand in Niger while Europe pours millions into blocking migration route. *The Guardian*. London, UK. 15 June 2023.

Hadiza, I.D., 2023. Agadez: 6 migrants calcinés dans l'incendie de leur véhicule près de Madama. *ActuNiger*. Niamey, Niger. 5 June 2023.

Carretero, L., 2023. 'Les migrants abandonnés dans le désert du Sahara n'ont aucune chance de survie', Selon une enquête de border forensics. *InfoMigrants*. Paris, France. 10 May 2023.

Monroy, M., 2023. Migrationspolitik in Niger: Mission erfüllt, *Neues Deutschland*. Berlin, Germany. 8 May 2023.

Shepherd, T., 2023. KPBS Evening Edition. *KPBS*. San Diego, CA, USA. 28 April 2023.

Scott, A., 2023. Map of border surveillance towers shows growing 'virtual wall' along US southern border. *Cronkite News, Arizona PBS*. Phoenix, AZ, USA. 28 April 2023.

Solis, G., 2023. Little known 'virtual' border wall creates privacy, safety concerns, advocates say. *KPBS*. San Diego, CA, USA. 21 April 2023.

Beaumont, H., 2023. Virtual wall: how the US plans to boost surveillance at the southern border. *The Guardian*. London, UK. 3 April 2023.

Harrigan, F., 2023. The Government Is Turning Border Surveillance on Everyday Americans. *Reason*. Los Angeles, CA, USA. 28 March 2023.

- Biddle, S., Devereaux, R., 2023. Mapping Project Reveals Locations of U.S. Border Surveillance Towers. New York, NY, USA. 20 March 2023.
- Asher-Schapiro, A., 2022. Surveillance tech makes U.S.-Mexico border even deadlier 23. *Context News, Thomson Reuters Foundation*. London, UK. November 2022.
- Beaumont, H., 2022. 'Never sleeps, never even blinks': the hi-tech Anduril towers spreading along the US border. *The Guardian*. London, UK. 16 September 2022.
- Phippen, J.W., 2021. 'A \$10-million scarecrow': The quest for the perfect 'smart wall'. *POLITICO*. Arlington, VA. 20 December 2021.
- Barros, A., 2021. Summer Turns Deadly for US-Bound Migrants Braving Scorching Desert Heat. *Voice of America*. Washington, DC, 29 July 2021.
- Calderón, A.R., 2021. Strict Border Enforcement Policies Put Migrants in Harm's Way. Title 42 Is No Exception. *The Marshall Project*. New York City, NY, 26 May 2021.
- Cataneo, E., 2021. In the Sonoran Desert, GIS Helps to Map Migrant Deaths. *Undark Magazine/Salon Magazine/High Country News, NPR*. Boston, MA, 31 March 2021.
- Neves, P., 2021. Dans le sud de l'Arizona, le désert de Sonora est devenu un cimetière de migrants. *Mediapart*. Paris, Fr, 6 March 2021.
- Chen, A., 2019. How far has technology come since the last 'smart border' failed? *The Verge*. New York City, NY, 22 February 2019.
- Misra, T., 2019. The Problem With a 'Smart' Border Wall. *Bloomberg CityLab*. New York City, NY, 12 February 2019.