
BIOGRAPHICAL SKETCH

NAME: Kelley Crews

eRA COMMONS USER NAME: KCREWS-MEYER

POSITION TITLE: Associate Professor, Department of Geography and the Environment

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
University of South Carolina, Columbia, SC	BS	05/1992	Marine Science
University of South Carolina, Columbia, SC	MA	05/1995	Government, International Studies
University of North Carolina, Chapel Hill, NC	Certificate	05/2000	Public Policy Analysis
University of North Carolina, Chapel Hill, NC	PhD	05/2000	Geography

A. Personal Statement

Crews has over fourteen years performing immersive fieldwork in the global tropics, with an emphasis on both savanna and flooding systems in developing states. Her epistemological contributions center on linking social surveys and satellite-based estimates of both ecosystem as human health, as complemented by field-based vegetation assessments of biodiversity and structure. She leverages both population-environment interactions literatures as well as socio-ecological systems theory against social science-based remote sensing for examining the reciprocal though asymmetrical feedbacks between human health / well-being and livelihoods with ecosystem health. That is, how resilient are each of these systems, and how they impact each other in terms of sustainable and resilient meta-systems? Her work falls in the PRC signature area of Population Health. Recent examples include 1) examining the competing needs of indigenous populations and wildlife conservation in a potential wildlife corridor proximate to the Central Kalahari Game Reserve, 2) understanding the impacts of cultural / familial institutional knowledge in responding to recent dramatic climate change-induced oscillations in flooding in the Okavango Delta, and 3) examining the face of *rural* HIV in southern Africa as a function of environmental gradients and human environmental (as compared to social) behaviors and cofactor exposure to understand the spatial distribution of the world's highest HIV prevalence rates to move beyond the simply social-behavioral model. She recently co-edited a volume published by Routledge: *Ecologies and Politics of Health* (King and Crews, 2012) in which she posits that a socio-ecological systems approach (Ostrom, 2009) allows for the tripartite leveraging of household-to-community scalar dynamics, ecosystem analyses, and remote sensing / spatial analysis advance theoretical and material contributions to understanding human health and its interconnection with ecosystem health. Health is becoming the focus of her work, as seen in her co-submission of "Closing the Conceptual Gap: Linking Spatial Variation in Health Disparities to Livelihoods and Land Use" to the National Science Foundation (PI McCusker West Virginia University, Crews PI of UTA subcontract). The recent addition to UT Austin of a medical school will provide the means to integrate her work with clinical field studies of disparities in HIV/AIDS risk, exposure, contraction, and progression as mitigated through migration, co-factor disease disparities (notably tuberculosis, malaria, and schistosomiasis) that have strong spatial and environmental correlates, allowing her to further her Fulbright-funded research I HIV disparities in rural populations and across rural-urban gradients. The administrative and scientific and technical services are essential to fulfillment of Crews research endeavors.

B. Positions and Honors**Positions and Employment**

2000	Postdoctoral Fellow, The University of North Carolina at Chapel Hill, NC, under S.J. Walsh
2000-present	Director, Digital Landscapes Laboratory, Department of Geography, The University of Texas at Austin, TX (hereafter "UTA")
2000-2005	Assistant Professor, Department of Geography, UTA
2001-Present	Faculty Research Associate, 1) Population Research Center, 2) Teresa Lozano Long Institute of Latin American Studies, 3) Center for Space Research, UTA
2001-2009	Founder and Director, Center for Geographic Information Science (GISc), UTA
2001-2005	Associate Director, Environmental Science Institute, UTA

2001-2006 Director, Geographic Computing Systems, Department of Geography, UTA
 2005-Present Associate Professor, Department of Geography and the Environment, UTA
 2009-2010 Research Faculty Fulbright Fellow, Africa Regional Research Program, HIV/AIDS Call 9044
 2010-Present Faculty Research Associate, Applied Research Laboratories, UTA
 2012-2014 Visiting Scientist, National Science Foundation, Arlington, VA, 1) Program Director, Geography & Spatial Sciences (GSS), 2) Program Director, Ecology & Evolution of Infectious Disease (EEID), 3) Junior Program Director, Coupled Natural-Human Systems (CNH), 4) Implementation Group, Science, Engineering, and Education for Sustainability (SEES), 5) NSF representative Predicting the Next Pandemic Inter-agency Working Group, 6) NSF representative, US Global Change Research Program (GCRP), 7) Alumna, NSF Facilitator Training Program

Other Experience and Professional Memberships

1999-Present Member, Sigma Xi Science Honor Society
 2001-2002 Faculty Career Awards Committee, Remote Sensing Specialty Group, Association of American Geographers
 2001-Present Founder and Chair, Remote Sensing Working Group and Environmental Policy Working Group, Environmental Science Institute, UTA
 2001-2007 Manager, ESRI & ERDAS university-wide GIS site licenses, UTA (backup admin 2007-2009)
 2001-2009 Elected Associate Director, Vice Chair, and Chair (2 years each) Remote Sensing Specialty Group, Association of American Geographers (hereafter AAG)
 2008 Panelist, Ecology of Infectious Disease, NSF (started 2008); panelist, Coupled Natural-Human Systems, NSF (started 2009).
 2004-2007 Technology Grant, 4 awards, total \$650k, Digital Geographies, College of Liberal Arts, UTA
 2004-2007 Deputy Director, Awards, American Society of Photogrammetry and Remote Sensing
 2005-2011 Editorial Board, Education Section, *Geocarto International*
 2006-Present Editorial Board, Earth Observation Section, *Geography Compass*; *Southwestern Geographer*
 2006-2008 Elected Secretary/Treasurer, Geographic Info. Science and Systems Specialty Group, AAG
 2007-2011 Member, University Working Group (Advisory Board), NASA SEDAC (Socioeconomic Data Archive), Columbia University CIESIN (Center for Intl Earth Science Information Network)
 2008-2010 Member, Editorial Board, *Professional Geographer*
 2008-Present Member, Editorial Board, *Open Ecology*
 2008-Present Member, Editorial Board, *International Journal of Applied Geospatial Research*
 2009-2010 Faculty Fulbright Research Fellow, Africa Regional Research Program, HIV/AIDS call
 2012-2014 Program Officer, National Science Foundation
 2014-2017 Chair, Landscape Specialty Group, Association of American Geographers
 Present Member, Association of American Geographers; Sigma Xi Scientific Research Society

Honors

2004 Dean's Fellow, *Integrating Remote Sensing, Geographic Information Systems (GIS), and Fieldwork for Managing Savanna Ecotone Processes*, College of Liberal Arts, UTA
 2007-2008 Humanities Institute Faculty Fellow, UTA
 2008 Population Research Center Summer Fellow, UTA
 2010 C2S: Cells to Society Biomarker Workshop, The Center for Social Disparities and Health, Northwestern University
 2012 Humanities Institute Faculty Fellow, UTA
 2014 University of Texas PLUS (Peer-led Undergraduate Studying) Course Conversion for Sustainability Curricula Award, UTA

C. Contributions to Science

1) In my years in rank as Associate Professor, there are several research trajectories that I have deepened and broadened. I still remain squarely in the research field of [human] population-environment interactions, though now with moving to include livelihoods I strive to speak to nature-society researchers and have further embraced and tested the social-ecological systems approach put forth by Elinor Ostrom. The SES framework has in fact fueled the way I think about landscapes and their spatio-temporal complexities (e.g., Crews 2013; Crews and Young 2013). To date one of the most subtle but important discoveries my team uncovered was that in seasonal environments, the most accurate time-series results come from either a relatively sparse time

series of satellite imagery or a very densely spaced and extended time series: but in the “middle numbers” accuracy of deconvolved time-series components actually decreases (Mishra et al 2012). The impacts for the remote sensing community who continue to use Landsat-based products or selectively subset for example MODIS time-series products is unanticipated, enormous, and potentially could mean many findings of landscape dynamics may in fact require re-assessment. This finding is especially important for informing conservation planning, and we look to revisit the Conservation International Wildlife Corridor project (Meyer, Crews, et al 2010) to consider implications there given and projected increasing variability of precipitation in this region as per the IPCC 5th Assessment, for which I was a federal reviewer for two chapters while at NSF.

2) I remain active in landscape science (e.g., as current elected Chair of the national AAG Landscape Specialty Group and former elected chair of the AAG Remote Sensing SG) and landscape ecology, with a growing emphasis on pushing pattern metric analysis specifically in the temporal dimension (e.g., Crews-Meyer 2006). I have also enjoyed stretching my landscape / pixel-based approach of pattern metric analysis to novel innovations for social science, such as using US Census data to test the applicability of the meaning and metaphor of fragmentation analysis for understanding social phenomena (e.g., Crews and Peralvo 2008). Growing remote sensing more firmly into the social sciences has been a strategic goal of much of my research and academic service, from NASA board service to expert statements (Crews 2010) to remote sensing definitive collections (Crews and Walsh 2009; Meyer and Crews-Meyer accepted; Crews and Christiansen invited, in prep for June submission; Crews et al invited, in prep for June submission). This strategy has also been an important extension of my intellectual service to our geographic and related communities, whether working as a Visiting Scientist at the National Science Foundation for two years or publishing on the importance of GIScience for STEM Higher Education (Crews and Miller 2016, in press), particularly given the debate among state and national education and governing officials of whether the social sciences, GIScience, and even “natural” sciences such as geography should be supported by US tax dollars (see Crews and Miller 2016, pages 12-14 of Chapter 6).

3) An intellectual and leadership leap I made as Associate Professor was to transition from working as a key remote sensing analyst, interviewer, and/or land change scientist into building my own team and project. I formed a team consisting of researchers from UT, Pennsylvania State University, and the University of Botswana and was awarded a NSF project for environment – livelihood dynamics in the Okavango Delta, Botswana (NSF # BCS-0964596, Crews PI). Finding, starting, funding, and corralling a dispersed but interactive team has been a time-intensive yet fundamental milestone for me, and despite the focus of that project on data collection, we are already turning out important results (Yurco et al, under review; King et al, accepted for 2016; Shinn et al 2014; Crews 2013; Crews and Young 2013), including an article in preparation (Crews et al, in prep for September submission to PNAS) that I believe will change the way we view socio-ecological systems (SESs) by quantitatively mapping relationships derived from semi-structured household interviews and remote sensing assessments into livelihood-environmental variability space through the use probability distribution functions to explain the spatio-temporal shifts of these relationships in systems and sub-systems of the region.

4) The Okavango Delta region presents rather unique challenges of a transboundary and highly seasonal wetland nestled in a savanna system. Savannas and their horizontal structure (tree:grass ratio) may also be better understood, I argue, by incorporating vertical structure as well. Thus rather than simply using a binary morphology (tree or shrub growth form), our team has developed a field-collection protocol collecting species and structural measurements along with visualization and analysis protocols to leverage field data against 2-D satellite imagery to extract classes of 3-D structural vegetation associations (Crews et al invited, in prep for June submission; also Christiansen et al AAG 2013 Biogeography student paper 1st place award). With small footprint lidar being unavailable or unaffordable in Botswana, this has been sorely needed in understanding savanna dynamics. With upcoming prescribed burns at Thakadu Game Ranch in Ghanzi, Botswana in areas where we have collected long-term vegetation data (since 2006), I believe in the future we will also be able to tie these structural differences to process-based and functional differences. Aiding in this effort is my planned extension to use Unmanned Aerial Vehicles for vegetation analysis in savanna systems in both Texas and, we hope as a pilot (pending permit approval) in Botswana.

5) My SES interests have also evolved on the human side to include human health (Crews 2013), and were certainly intensified during my service on the multi-agency Working Group on Predicting the Next Pandemic as

a NSF representative. Expanding upon my trial efforts through my Fulbright, I believe remote sensing can be more squarely beneficial to understanding human disease through environmental and disease-cofactor components such as the detection of malaria and schistosomiasis habitats as risk factors for HIV and TB infection / transmission / progression. I now realize that my work in the Peruvian Amazon sparked a long term interest in the co-occurrence of healthy, resilient, or vulnerable landscapes / ecosystems with healthy, resilient, or vulnerable human populations. I am excited to extend this work with new collaborators in new places, including a recent (September 1, 2016) submission for a project in Malawi (McCusker, Crews, and Miller) and a November submission for work in southwestern Kalahari of Botswana (Okin, Crews, and Carney). In each case livelihoods, access regimes, human health, ecosystem health, and their reciprocal feedbacks are being assessed through focus groups, household interviews, vegetation and soil sampling, and remote sensing, spatial, and fragmentation analysis. My interests have also evolved to consider a given person's or cultural group's ability to perceive environmental variability in different fluvial geomorphological regimes based upon work in the Peruvian Amazon and several systems of the larger Okavango Basin. I am currently working on collaborating with one of my PhD students who was recently awarded a Fulbright to integrate paleo-hydro work regarding channel switching with current capabilities of environmental perception given residence time of that family or social network, and expect this to be a research theme I can trace back to many environments in which I have worked as well as new fluvial systems.

Complete List of Published Work in MyBibliography:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/kelley.crews-meyer.1/bibliography/51176699/public/?sort=date&direction=descending>

D. Research Support

Ongoing Research Support

BCS-0964596 (K.A. Crews, PI)

09/01/11-08/31/17

National Science Foundation

Environmental Uncertainties and Livelihood Thresholds in the Okavango Delta, Botswana

This foundational research will combine insights from the social and natural sciences to understand how spatial and temporal uncertainty and variability shape the multiscale linkages within and among social-ecological systems (SEs).

Role: Principal Investigator

Responsibilities: Oversight of research design protocols, lead remote sensing analysis, lead integration of remote sensing and household survey integration, lead fieldwork campaigns, lead vegetation fieldwork

Completed Research Support

None