



LI AN

Professor of Geography



(Personal)

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HIGHER EDUCATION

- Ph.D., Systems Modeling, Michigan State University, East Lansing, Michigan, 2003.
- M.S., Probability and Statistics, Michigan State University, East Lansing, Michigan, 2002
- M.S., Systems Ecology, Chinese Academy of Sciences, Beijing, China, 1992.
- B.S., Urban and Regional Planning (Economic Geography), Beijing (Peking) University, Beijing, China, 1989.

POSITIONS

- Professor, Department of Geography, San Diego State University (SDSU), 2013 - present
- Associate Professor, Department of Geography, San Diego State University, 2009 - 2013
- Assistant Professor, Department of Geography, San Diego State University, 2005 - 2009
- Adjunct Professor, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, 2008 - present
- Postdoctoral Research Fellow, University of Michigan, Ann Arbor, Michigan, 2003 - 2005

RECENT PROGRESS HIGHLIGHTS

1. Advisor of NASA Earth and Space Science Fellowship “Mapping and modeling the invasion of *Mikania Micrantha* in the Chitwan community forests, Nepal: A coupled human and natural systems approach”. PI (PhD student): Jie Dai (17-EARTH17F-337).
2. Awardee (as lead-PI) of NSF project “ABM’17: The usefulness, uselessness, and impending tasks of agent-based models in social, human-environment, and life sciences” (BCS-1638446; 2016-2018).
3. The 2013-2014 Outstanding International Scholar Award at San Diego State University, which annually recognizes a distinguished faculty member with demonstrated outstanding contributions to the international arena. Reprinted in Handbook of Applied System Science (Routledge Handbooks) 1st Edition by Zachary P. Neal (Editor), 2016.
4. Editorial Board Member of

- a. *Annals of the American Association of Geographers*, the flagship journal in geography (2013-2016).
 - b. *International Journal of Geospatial and Environmental Research* (IJGER).
 - c. *Ecological Modelling*, an international journal on ecological modelling and systems ecology (2013-2016).
5. Awardee of the SDSU President's Leadership Fund in 2014, which aims at "building on excellence" in support of student success, research and creative endeavors, and community and communication.
 6. Prominent faculty in 2013 recognized in The Campanile Foundation (TCF) Board Dinner, September 11, 2013 (by SDSU President Elliot Hirshman, Vice President for Research Stephen Welter, and Dean of College of Arts and Letters Paul Wong).
 7. The NSF Award "CNH: Impacts of ecosystem service payments in coupled natural and human systems" has been reported by Daily Aztec (SDSU newspaper) and SDSU Website in 2012.
 8. Chair of Spatial Analysis and Modeling (SAM) Specialty Group (elected), the Association of American Geographers in 2012-2015.
 9. Guest-editor of a special issue entitled "Mapping and disentangling human decisions in complex human-nature systems" for the journal *Ecological Modelling* in 2012.
 10. The NSF Project on understanding micro human-environment interaction through agent-based modeling (as Co-PI; dissertation of Doctoral student Alex Zvoleff) has been featured by the National Association of Science Writers at <http://www.nasw.org/modeling-interplay-people-and-places> in 2011.
 11. Outstanding Paper Award in Landscape Ecology (2006): "Exploring Complexity in a Human-Environment System: An Agent-based Spatial Model for Multidisciplinary and Multiscale Integration" (by An et al. 2005 in *Annals of the Association of American Geographers* 95(1): 54-79). The US Chapter of the International Association of Landscape Ecologists. Reprinted in *Handbook of Applied System Science* (Routledge Handbooks) 1st Edition by Zachary P. Neal (Editor), 2016

RESEARCH PROFILE

OVERALL RESEARCH GOALS

Research focuses on understanding, envisioning, and planning of **Complex Human-Environment Systems (CHES)** through digital, 4-dimensional (x, y, z, time) representation & visualization, computation, space-time analysis, micro-level modeling, and simulation. Complexity theory, landscape ecology, geographic information science, cyberinfrastructure theory and technology, big data science, and other relevant domain knowledge (e.g., sociology, demography) leverage theoretical and methodological support toward this goal.

SPECIFIC INTERESTS AND ACTIVITIES

1. **Revealing dynamics and mechanisms of complex human-environment systems through international, interdisciplinary, and inter-scale (local-global, short-long term, lower-upper level) research.**
 - *Understanding the impacts of payments for ecosystem services (PES) on complex, reciprocal human-environment interactions.* Current work on an NSF project (2012 – 2017; as PI) focuses on China's national "Grain-to-Green Program" and "National Forest Conservation Program" in Fanjingshan

National Nature Reserve, China. Using multilevel simultaneous equations models and agent-based models, current work highlights complexity features, e.g., nonlinearity, heterogeneity, feedback, time lags, and thresholds in the human-landscape system. One exemplar pursuit in this line is to study policy interactions in Fanjingshan National Nature Reserve, in which household survey (with use of Google Earth), satellite imagery, vegetation plot, and camera trapping data were collected. Preliminary findings suggest that implementation of one conservation policy is weakening even canceling out another conservation policy, and the theory of the multiphasic responses can be enriched (modified) to explain such policy interaction.

- *Building and maintaining dynamic spatial databases with temporal stamps.* In the context of the payments for ecosystem services (PES) project (2012-2017), a comprehensive database has been being constructed (near completion). This database includes ecological (e.g., camera trapping photos, vegetation plots), socioeconomic (e.g., household interview, participatory mapping, governmental archives, population census), and geospatial (Shapefiles, ASCII files, GPS measurements) data. Protocols and guidelines have been developed to allow all team members to interact with the spatial and non-spatial data, to contribute to the data (with the supervisor's approval), and to update the database with a history of actions.
 - *Documenting and modeling species-environment relationships in urban-exurban-rural contexts.* Current work focuses on a) the Guizhou snub-nosed monkey in Fanjingshan National Nature Reserve, China using camera trapping data and GIS approach; b) the coastal cactus wren and the coastal California gnatcatcher in southern California (thesis of Jennifer Vaughan); c) the Red-crowned parrot in southern California (thesis of Kristin Meseck; 2013); and d) the tiger and the rhino (thesis of Curtis Battle) using camera trapping and satellite data at Chitwan National Park, Nepal.
 - *Modeling reciprocal relationships between micro population processes and the environment.* The aim of a completed NSF project (2008 – 2013; as Co-PI) is on simulating micro-level decisions (e.g., marriage timing, childbearing, and migration) in Chitwan Valley, Nepal in the context of many ecological, socio-political, and institutional processes from local to global levels. Also efforts are being made on exploring interactions among local livelihood, socio-demographical processes, ecotourism, and landscape changes (e.g., land use and land cover change) in Fanjingshan National Nature Reserve, China.
 - *Exploring the impact of “telecouplings” of various distant coupled human-environment systems.* This is a recent conceptual advance in consideration of the telecoupling mechanisms (e.g., social weak ties, exchange of information, long-distance indirect consumption, tourism) through which distant and seemingly “separated” or “unrelated” coupled human and natural systems may affect each other. Such *telecouplings* may take the form of labor migration, tourism, consumption of goods manufactured and transported from afar, and so on. Several papers and projects are at various stages—completed, ongoing, or under plan.
2. **Developing a digital, high performance (big data friendly, parallel/clouds computing enabled, web-based), and 4-D holographic methodology to facilitate geo-representation/visualization, animation, space-time analysis and modeling, and micro-level simulation of various complex human-environment systems (CHES).**

- *Developing spatially explicit agent-based modeling libraries, modules, pseudo-code, protocols, and demos.* An agent-based model is a computerized, digital model that simulates the decision and behavior of decision-makers (agents) under some contexts (often including an environment), which change status and/or interact with one another over time according to prescribed rules. ABMs have been developed in various contexts/platforms/languages/standards, presented with varying levels of model details, lacking transparency and reusability, and subject to difficulties of model validation. Focus has been placed on developing improved, sharable ABMs (or modules) and protocols that help the broader scientific and practitioner communities to better envision, understand, and plan human-landscape processes over space and time. One example agent-based model is developed in Netlogo for better understanding of human-landscape interaction (<http://complexities.org>). More information at <http://complexities.org/Methodology/CHANS-ABMs/CHANS-ABMs.htm>.
- *Modeling human decisions in complex human-environment systems.* Human decision models in relation to CHES understanding, envisioning, and planning range from highly empirically-based ones (e.g., derived through trend extrapolation, regression analysis, expert knowledge based systems, etc.) to more mechanistic or processes-based ones (e.g., econometric models, psychosocial and cognitive models). Human institutions, social norms, empirical or heuristic rules, and evolutionary programming should be increasingly used as human decision models. Special attention has been paid towards using ABM to model human decisions and the related environmental consequences under the complex systems theory. Here is a 4-D demo showing simulation of human decisions under various assumptions or conditions (<http://complexities.org>).
- *Developing high-performance (e.g., web-based, parallel or clouds computing-enabled, GIS-, cellular automata-, and big data-friendly) 4-D agent-based models.* Focus has been placed enabling 4-Dimensional (x, y, z, and time) modeling, animation, and rendering of hyperlocal human-landscape processes through leveraging parallel or clouds computing. One exemplar web-based 4-D model is posted at <http://complexities.org/> (on the lower-right corner). This 4-D model simulates pedestrian evacuation scenarios on city streets due to the Waldo Canyon Fire (2012), which caused the evacuation of over 32,000 residents of several cities including Colorado Springs.
- *Integrating latent trajectory models (LTM) with the eigenvector spatial filtering (ESF) method.* This LTM-ESF integration is the first attempt to apply LTM to study landscape changes while handling spatial autocorrelation of regression residuals through ESF. This method is intended for longitudinal spatial data mining and information extraction through simultaneously taking into accounts both spatial and temporal autocorrelations. This method enables landscape modelers elegantly handle variabilities over both time and space (<http://complexities.org/Methodology/LTMs/LTMs.htm>).
- *Developing a unique land survival analysis (LSA) methodology for urban studies.* LSA is especially useful to handle imprecise time stamps in urban and exurban landscape changes, to evaluate temporally changing impact of some variables on landscape events, and to extract space-time patterns hidden in regular snapshot multi-time datasets. Fundamental metrics in traditional survival analysis (also termed as event history analysis, failure time analysis, etc.) such as hazard rates and survival probability have been introduced in order to better understand dynamic landscape changes (<http://complexities.org/Methodology/LSA/LSA.htm>).
- *Developing a new computational methodology called "pseudo-history analysis".* This methodology enables employing agent-based models to generate space time data (i.e., longitudinal spatial data,

time series spatial data) under a set of predetermined rules, applying candidate statistical models to analyze such data, and detecting the statistical models (or model specifications or sampling strategies) that best uncover the preset rules. The goal is to offer new insights into the application domain of several statistical methods and sampling strategies. One application is to study the similarities and differences in the development trajectories of San Diego and Tijuana over the past 60 years (dissertation topic of Ninghua Wang).

3. Performing hazard analysis for improved planning (e.g., preparedness, envisioning), management (e.g., response, mitigation), and recovery (trajectory representation, simulation).

- *Modeling and envisioning interactions among wildfires, human adaptation, and landscape change.* An agent-base model was developed (posted at <http://complexities.org/index.html>) to understand complex feedback loops among the 2012 Waldo Canyon Fire at Colorado, river geomorphological change, and human adaptations (e.g., building a fence, paving the channel bedrock) over both space and time. Continued efforts (e.g., ABM demos, grant proposals) are being invested on seeking improved understanding about complex feedback loops among place and timing of fires, mitigation (e.g., fence building, channel pavement), and landscape changes.
 - *Seeking enhanced strategies for invasive species mitigation and control.* One of the world's most invasive plants, *Mikania micrantha* (also called "mile-a-minute weed"), is rapidly spreading through the subtropical forested buffer zone surrounding Chitwan National Park, Nepal. Current work on an NSF project (2012 – 2016; as Co-PI) studies how human communities and nearby landscapes interact with this natural hazard in a rapidly-changing social (urbanization) and biophysical context. In particular, efforts are being invested on geo-representing, modeling, and simulating the dependencies among various human and landscape processes, which are mediated by social non-family organizations (e.g., employers, clinics, post-offices, banks) and urbanization processes.
 - *Documenting and modeling vegetation changes on various landscapes.* Current work focus on supervising or conducting vegetation surveys, collecting ground-truth control points, and performing Landsat or other high resolution imagery-based supervised classification and subsequent analysis. These data serve as indicators of pre-hazard landscape health, of ongoing hazard severity, and of post-hazard restoration success.
- ### **4. Exploring pathways toward improved human health through better environmental planning, management, and conservation.**
- *Modeling and simulating complex relationships among morbidity, mortality, and urban residents' neighborhood recognition.* Urban neighborhood context is recognized as an important predictor of individual-level behaviors and health outcomes. However, defining neighborhoods is a challenge across the social sciences. Investigations of the role of neighborhood context in individual-level decision making and health outcomes are conducted in many fields such as public health, geography, and urban and regional planning with no consistent approaches. Using data from the Women's Health Study of Accra, Ghana, a spatially explicit agent-based model was developed to examine how alternative neighborhood definitions affect modeling of individual-level health outcomes.
 - *Geovisualizing and simulating complex relationships among human health, economic development, and the biophysical environment.* My work in one completed NIH project (as co-investigator) focused

on testing the hypothesis that spatial differences and temporal changes in health and mortality outcomes vary as functions of urban context using an agent-based modeling approach. An ongoing NASA project (as Co-PI) aims to predict the impact of landscape characteristics on human life quality and health outcomes (e.g., child mortality, slum indices) in Accra, Ghana. Advanced geovisualization and analytical approaches, e.g., statistical metrics and agent-based models are employed to understand these relationships.

- *Envisioning and understanding obesity dynamics using longitudinal spatial data in sub-Saharan African cities.* One method has been developed to combine latent trajectory models (LTM) with the eigenvector spatial filtering (ESF) approach to perform longitudinal spatial data analysis. In the NASA project, an obesity index named body mass index (BMI) has been linked to land cover, household size, household infrastructure, etc. The findings suggest that BMI has been growing at various trajectories with a decelerating rate, and a number of covariates have impacted these trajectories. The findings also support the assertion that increasing urbanization shows the most consistent, significant impact on the substantial BMI growth.

5. Understanding the past, present, and future of cities and city dwellers in the context of emerging socio-political and environmental challenges.

- *Disclosing the mechanisms and dynamics of urban/exurban development.* Past work shows that in studying urban and exurban landscape dynamics, an overall category of “residential” development type may mask many important features or driving forces. Differentiating urban subdivision or neighborhood types may help explain the timing, location, and driving mechanisms of various urban sprawl patterns. Past and current work focuses on the impact of urban development (e.g., urbanness) on city residents’ health outcomes and quality-of-life measures (NASA and NIH projects, 2009 – present, co-investigator; NIH and NSF proposals in-review as co-investigator).
- *Testing the usefulness of cyberspace data in the urban research domain.* A current project aims at establishing a unique urban geography horizon: cyberspace data are able to profile important dimensions of urban dwellers, which cannot be achieved through traditional qualitative and quantitative data analysis. Now twitter, webpage, census, and the Gallup survey data are being collected to make links between cyberspace (e.g., about “climate change” and “global warming”) and real-space data about urban dwellers’ interest in climate change (NSF project, 2010 – 2015; senior personnel). Also this project aims to visualize and analyze pattern changes in both cyberspace and real-space landscapes.

6. Establishing and maintaining various CHES research, education, and outreach networks.

- *Establishing a long term research, education, and outreach partnership.* This partnership between San Diego State University and Fanjingshan National Nature Reserve features research about ecology of the Guizhou golden monkeys and its interaction with local human communities. Travel awards (from China’s State Bureau of Foreign Experts) were given to the SDSU team (led by Li An) in 2009, 2012, 2013, 2014, and 2015. Together with the Zoological Society of San Diego (ZSSD), FNNR Delegations were invited to visit San Diego in 2009, 2011, 2012, 2013, 2014, and 2015.
- *Collaborating with international organizations.* Drs. Zhiyun Ouyang and Weihua Xu from the Chinese Academy of Sciences (CAS) and collaborators from Fanjingshan National Nature Reserve (China)

provide assistance in student recruiting, local logistics, and other related aspects. Also collaboration has been established with Institute of Social Research (ISR) at University of Michigan and Institute of Social and Ecological Research (ISER) at Nepal. Several research projects make use of ISR's long-term (since 1996) and detailed longitudinal data to explore the relationships among population processes, land use, and social context in Chitwan National Park, Nepal.

- *Co-organizing and participating in training workshops.* From 2008 to 2013 (one week in August), a set of training workshops were organized to train students and junior faculty members in: 1) social survey methodology (e.g., mixed method data collection, household history calendar, community history calendar; speaker: social demographer William Axinn, 2) population processes and non-family organization (speakers: sociologists Scott Yabiku and Dirgha Ghimire), and 3) agent-based modeling (speaker: geographer and landscape ecologist Li An).

GRANTS AND PROJECTS (as PI, Co-PI, or Senior Personnel):

- Project Director/Advisor, NASA Earth and Space Science Fellowship "Mapping and modeling the invasion of *mikania micrantha* in the Chitwan community forests, Nepal: A coupled human and natural systems approach" (17-EARTH17F-337). PI (PhD candidate): Jie Dai. Total budget: \$42,093, 2017-2019.
- PI, University of Hradec Králové Grant "Simulation of migration theories – SioMiTe" (Czech Republic; Co-PIs: Jiří Šedivý, Jan Österreicher, and Hana Tomášková), 1,553,600 Czech crowns (\$71,341), 2017-2018.
- PI, NSF project "ABM'17: The usefulness, uselessness, and impending tasks of agent-based models in social, human-environment, and life sciences" (BCS-1638446; Co-PIs: Piotr Jankowski, Steven Manson, B. L. Turner II, Shaowen Wang, Elena Irwin, Sigrunn Eliassen). Total budget: \$94,996, 2016-2018.
- PI, NSF project "CNH: Impacts of ecosystem service payments in coupled natural and human systems" (DEB-1212183; co-PIs: Douglas Stow, Stuart Aitken, Rebecca Lewison, Xiaodong Chen). Total budget: \$1,299,917, 2012-2016.
- PI, SDSU President's Leadership Fund project "Cross the border: Immerse undergraduates in conservation"). Total budget: \$7,500.
- Co-PI, NSF project "CNH: Feedbacks between human community dynamics and socio-ecological vulnerability in a biodiversity hotspot" (BCS-1211498; PI: Scott T. Yabiku at Arizona State University). Total budget: \$1,449,521, 2012-2016.
- Co-investigator, NASA project "The urban transition in Ghana and its relation to land cover and land use change through analysis of multi-scale and multi-temporal satellite image data" (11-IDS11-42; PI: Douglas Stow). Total budget: \$992,960, 2012-2015.
- Co-PI, NSF project "PIRE collaborative research and training in social context, population processes, and environmental change" (OISE-0729709; PI: William Axinn, University of Michigan). Total budget secured: \$2,500,000, 2007-2012 (with a no-cost extension to 2013).
- Senior personnel, NSF CDI project "Mapping cyberspace to real-space: visualizing and understanding the spatiotemporal dynamics of global diffusion of ideas and the semantic web". Total budget: \$ 1,300,000, 2010-2015.
- PI, SDSU internal grant "Where are the golden monkeys? A predictive habitat analysis". Total budget: \$5,068, 2009-2010.

- PI, SDSU internal grant “Sampling at what scales? A computational simulation approach”. Total budget: \$9,654, 2008-2009.
- PI, SDSU internal grant “Complexity science in support of disaster alleviation—preference, place, and promise”. Total budget: \$9,857, 2005-2006.
- PI, Zoological Society of San Diego grant “Does ecotourism help conserving the nature? A case study of the Fanjingshan National Nature Reserve, China”. Total budget: \$1,100, 2009-2010.
- Project director, Margot Marsh Biodiversity Foundation grant “Documenting impacts of illegal mining on the Guizhou golden monkey, *Rhinopithecus brelichi*, in Fanjingshan National Nature Reserve, China” (Student PI: Sarah Wandersee). Total budget: \$12,000, 2009-2010.
- PI, Shared Visions Grant, Department of Geography, San Diego State University. Total: \$2,160, 2005-2006.

GRANTS AND PROJECTS (as collaborator or consultant):

- Collaborator, NIH project “Health, poverty, and place: modeling inequalities in Accra using RS and GIS” (PI: John. W. Weeks, SDSU). Total budget: 3,057,586, 2007-2012.
- Collaborator, NSF project “S12-S212 Conceptualization: Geospatial software institute” (PI: Shaowen Wang, UIUC), Total budget: \$500,000, 2017-2018.

PEER-REVIEWED JOURNAL ARTICLES (*Graduate students working with or advised by Li An):

1. Sullivan, A.*, A.M. York, and L. An (2018). Which perspective of institutional change best fits empirical data? An agent-based model comparison of rational choice and cultural diffusion in invasive plant management. *Journal of Artificial Societies and Social Simulation* 21(1):5.
2. Freeman, M., D*. Stow, and L. An (2017). Patterns of mortality in a montane mixed-conifer forest in San Diego County, California. *Ecological Application* 27(7):2194-2208.
3. Lewison, R., L. An, and X. Chen (2017). Reframing the payments for ecosystem services framework in a coupled human and natural systems context: Strengthening the integration between ecological and human dimensions. *Ecosystem Health and Sustainability* 3(5), 2017, 1335931. <https://doi.org/10.1080/20964129.2017.1335931>
4. Sullivan, A.*, A.M. York, L. An, S.T Yabiku, and S.J. Hall (2017). How does perception at multiple levels influence collective action in the commons? The case of Mikania micrantha in Chitwan, Nepal. *Forest Policy and Economics* 80:1-10.
5. An, L., M. Tsou, B. Spitzberg, J.M. Gawron, and D.K. Gupta (2016). Latent trajectory models for space-time analysis: An application in deciphering spatial panel data. *Geographical Analysis* 48 (3): 314–336 (<http://dx.doi.org/10.1111/gean.12097>).
6. Tsai, Y*., D. Stow, L. Shi, R. Lewison, and L. An (2016). Quantifying canopy fractional cover and change in Fanjingshan National Nature Reserve, China using Multi-temporal Landsat imagery. *Remote Sensing Letters* 7(7): 671-680.
7. Luo, N.*, L. An, A. Nara, X. Yan, and W. Zhao (2016). GIS-based multielement source analysis of dustfall in Beijing: A study of 40 major and trace elements. *Chemosphere* 152: 123-131.
8. Crook, S.E.S.*, L. An, D.A. Stow, and J.R. Weeks (2016). Latent trajectory modeling of spatiotemporal relationships between land cover and land use, socioeconomics, and obesity in Ghana. *Spatial Demography* 4(3): 221-244. (DOI 10.1007/s40980-016-0024-6).
9. Chin, A., L. An, J. Florsheim, L. Laurencio, R. Marston, A. Parker, G. Simon, and E. Wohl (2016). Feedbacks in human-landscape systems: lessons from the Waldo Canyon Fire of Colorado, USA. *Geomorphology* 252(2016): 40-50. <http://dx.doi.org/10.1016/j.geomorph.2015.07.030>

10. **An, L.**, M. Tsou, S. Crook*, B. Spitzberg, J.M. Gawron, and D.K. Gupta (2015). Space-time analysis: Concepts, methods, and future directions. *Annals of Association of American Geographers* 105(5): 891-914.
11. Liu, J., V. Hull, J. Luo, W. Yang, W. Liu, A. Viña, C. Vogt, Z. Xu, H. Yang, J. Zhang, **L. An**, X. Chen, S. Li, W. McConnell, Z. Ouyang, W. Xu, and H. Zhang (2015). Multiple telecouplings and their complex interrelationships. *Ecology and Society* 20(3):44. <http://dx.doi.org/10.5751/>
12. Chen, X., A. Viña, A. Shortridge, **L. An**, and J. Liu (2014). Assessing the effectiveness of payments for ecosystem services: an agent-based modeling approach. *Ecology & Society*. 19(1):7 <http://dx.doi.org/10.5751/ES-05578-190107>
13. Aslam, A. A., M. H. Tsou, B. Spitzberg, **L. An**, J. M. Gawron, D.K. Gupta, K. M. Peddecord, A. C. Nagel, C. Allen, J. Yang, and S. Lindsay (2014). The Reliability of Tweets as a Supplementary Method of Seasonal Influenza Surveillance. *Journal of Medical Internet Research*. <http://www.jmir.org/2014/11/e250/>
14. **An, L.**, A. Zvoleff, J. Liu, and W. Axinn (2014). Agent based modeling in coupled human and natural systems (CHANS): Lessons from a comparative analysis. *Annals of Association of American Geographers* 104(4): 723–745.
15. Nagel, A. C., M. H. Tsou, B. Spitzberg, **L. An**, J. M. Gawron, D.K. Gupta, J. Yang, S. Han, K. M. Peddecord, S. Lindsay, and M.H. Sawyer (2013). The complex relationship of real-space events and messages in cyberspace: a case study of influenza and pertussis using tweets. *Journal of Medical Internet Research* 15(10): e237. <http://www.jmir.org/2013/10/e237/>
16. Zvoleff, A.* , and **L. An** (2014). The effect of reciprocal connections between demographic decision making and land use on decadal dynamics of population and land use change. *Ecology and Society* 19(2): 31.
17. Zvoleff, A.* , and **L. An**. (2014). Analyzing human-landscape interactions: tools that integrate. Special issue on “The Future of Human-Landscape Interactions: Drawing on the Past, Anticipating the Future”, (eds: A. Chin, K. Galvin, A. Gerlak, and E. Wohl), *Environmental Management* 53: 94-111.
18. Wang, N.* , D. G. Brown, **L. An**, S. Yang, and A. Ligmann-Zielinska (2013). Comparative performance of logistic regression and survival analysis for detecting spatial predictors of land-use change. *International Journal of Geographic Information Science* 27(10): 1960-1982. <http://dx.doi.org/10.1080/13658816.2013.779377>.
19. Spitzberg, B., M. H. Tsou, **L. An**, D. Gupta, and J. M. Gawron (2013). The Map is not which territory?: Speculating on the geospatial diffusion of ideas in the Arab Spring of 2011. *Studies in Media and Communication* 1(1): 101-115.
20. Tsou, Ming-Hsiang, J. Yang, D. Lusher, S. Han, B. Spitzberg, J. M. Gawron, D. Gupta, and **L. An** (2013). Mapping social activities and concepts with social media (twitter) and web search engines (Yahoo and Bing): A case study in 2012 U.S. presidential election. In 2012 AutoCarto Conference Special Issue. *Cartography and Geographic Information Science* 40(4): 337–348. <http://dx.doi.org/10.1080/15230406.2013.799738>.
21. Tsou, M. H., I. H. Kim, S. Wandersee*, D. Lusher, **L. An**, B. Spitzberg, D. Gupta, J. Gawron, J. Smith, J.A. Yang, and S. Y. Han (2013). Mapping ideas from cyberspace to realspace: visualizing the spatial context of keywords from web page search results. *International Journal of Digital Earth* 7(4): 316-335 (Special Issue on Analytical Geospatial Digital Earth). DOI: 10.1080/17538947.2013.781240.
22. **An, L.**, D. López-Carr (2012). Editorial: Understanding human decisions in coupled human-nature systems. *Ecological Modelling* 229(24): 1-4.
23. **An, L.** (2012). Modeling human decisions in coupled human and natural systems: review of agent-based models. *Ecological Modelling* 229(24): 25-36.

24. Wandersee, S.M.*, **L. An**, D. López-Carr, Y. Yang (2012). Perception and decisions in modeling coupled human and natural systems: a case study from Fanjingshan National Nature Reserve, China. *Ecological Modelling* 229(24): 37-49.
25. Chen, X., F. Lupi, **L. An**, R. Sheely, A. Viña, J. Liu. (2012). Modeling the effects of social norms on enrollment in payments for ecosystem services. *Ecological Modelling* 229(24): 16-24.
26. Aitken, S. C., and **L. An** (2012). Figured worlds: Environmental complexity and affective ecologies in Fanjingshan, China. *Ecological Modelling* 229(24): 5-15.
27. **An, L.**, D. G. Brown, J. Nassauer, and B. Low (2011). Variations in development of exurban residential landscapes: Timing, location, and driving forces. *Journal of Land Use Science*. 6 (1): 13–32.
28. **An, L.**, and J. Liu (2010). Long-term effects of family planning and other determinants of fertility on population and environment: agent-based modeling evidence from Wolong Nature Reserve, China. *Population and Environment* 31:427–459.
29. He, G., M. Colunga, S. Bearer, **L. An**, M. Linderman, S. Zhou, J. Huang, S. Gage, Z. Ouyang, J. Liu (2009). Spatial and temporal patterns of fuelwood collection in a nature reserve: implications for panda conservation. *Landscape and Urban Planning* 92(1): 1-9.
30. **An, L.**, and D. G. Brown (2008). Survival analysis in land-change science: integrating with GIScience to address temporal complexities. *Annals of Association of American Geographers* 98(2): 323-344.
31. Rindfuss, R. R., B. Entwisle, S. J. Walsh, **L. An**, D. G. Brown, P. Deadman, T. P. Evans, et al (2008). Land use change: Complexity and comparisons. *Journal of Land Use Science* 3(1): 1-11.
32. Parker, D. C., B. Entwisle, R. R. Rindfuss, L. K. VanWey, S. M. Manson, E. Moran, **L. An**, P. Deadman, T. Evans, M. Linderman, and G. Malanson (2008). Case studies, cross-site comparisons, and the challenge of generalization: Comparing agent-based models of land-use change in frontier regions. *Journal of Land Use Science* 3(1): 41-72.
33. Bearer, S. L., M. Linderman, J. Huang, **L. An**, G. He, and J. Liu (2008). Effects of fuelwood collection and timber harvesting on giant panda habitat use. *Biological Conservation* 141(2): 385-393.
34. Brown, D. G., D. T. Robinson, J.I. Nassauer, and **L. An**, S.E. Page, B. Low, W. Rand, M. Zellner, R. Riolo, and J.J. Taylor (2008). Exurbia from the bottom-up: confronting empirical challenges to characterizing a complex system. *GeoForum* 39(2): 805-818.
35. Viña, A., S. Bearer, X. Chen, G. He, M. Linderman, **L. An**, H. Zhang, Z. Ouyang, and J. Liu (2007). Temporal changes in connectivity of giant panda habitat across the boundaries of Wolong Nature Reserve (China). *Ecological Applications* 17(4): 1019-1030.
36. **An, L.**, G. He, Z. Liang, and J. Liu (2006). Impacts of demographic and socioeconomic factors on spatio-temporal dynamics of panda habitats. *Biodiversity and Conservation* 15: 2343-2363.
37. Linderman, M., **L. An**, S. Bearer, G. He, Z. Ouyang, and J. Liu (2006). Interactive effects of natural and human disturbances on vegetation dynamics across landscapes. *Ecological Applications* 16(2): 452-463.
38. **An, L.**, M. Linderman, J. Qi, A. Shortridge, and J. Liu (2005). Exploring complexity in a human-environment system: an agent-based spatial model for multidisciplinary and multi-scale integration. *Annals of Association of American Geographers* 95 (1): 54-79.
39. Linderman, M., **L. An**, S. Bearer, G. He, Z. Ouyang, and J. Liu (2005). Modeling the spatio-temporal dynamics and interactions of households, landscapes, and giant panda habitat. *Ecological Modelling* 183(1): 47-65.
40. Linderman, M., S. Bearer, **L. An**, Y. Tan, Z. Ouyang, and J. Liu (2005). The effects of understory bamboo on broad-scale estimates of giant panda habitat. *Biological Conservation* 121 (2005) 383-390.

41. Linderman, M., J. Liu, J. Qi, Z. Ouyang, **L. An**, J. Yang, and Y. Tan (2004). Using artificial neural networks to map the spatial distribution of understory bamboo from remote sensing data. *International Journal of Remote Sensing* 25 (9): 1685-1700.
42. **An, L.**, A. Mertig, and J. Liu (2003). Adolescents' leaving parental home in Wolong Nature Reserve (China): psychosocial correlates and implications for panda conservation. *Population and Environment: A Journal of Interdisciplinary Studies* 24 (5): 415-444.
43. **An, L.**, F. Lupi, J. Liu, M. Linderman, and J. Huang (2002). Modeling the choice to switch from fuelwood to electricity: implications for giant panda habitat conservation. *Ecological Economics* 42(3): 445-457.
44. Ouyang Z., Z. Li, J. Liu, **L. An**, H. Zhang, and Y. Tan (2002). The recovery processes of giant panda habitat in Wolong Nature Reserve, Sichuan, China. *Acta Ecologica Sinica* 22: 1840-1849 (in Chinese with English abstract).
45. **An, L.**, J. Liu, Z. Ouyang, M. Linderman, S. Zhou, and H. Zhang (2001). Simulating demographic and socioeconomic processes on household level and implications for giant panda habitats. *Ecological Modelling* 140: 31-49.
46. Liu, J., M. Linderman, Z. Ouyang, and **L. An** (2001). The pandas' habitat at Wolong Nature Reserve -- response. *Science* 293: 603-605.
47. Liu, J., M. Linderman, Z. Ouyang, **L. An**, J. Yang, and H. Zhang (2001). Ecological degradation in protected areas: the case of Wolong Nature Reserve for giant pandas. *Science* 292: 98-101.

PEER-REVIEWED BOOK CHAPTERS (*Graduate students advised by Li An):

1. **An, L.**, and J. Dai (in press). Space time analysis. In H. Lin, X. Shi, X. Ye, and Y. Guan (Editors): *Frontiers in Geographic Information Science* (in Chinese). Advanced Education Press: Beijing.
2. Dai, J*, and **L. An** (in press). Time geography. In *GIS principles and technical designs of GIS* edited by T.J. Cova and M. Tsou, a volume in *Comprehensive Geographic Information Systems* (editor B. Huang), Elsevier.
3. **An, L.**, and S. Crook (2016). Spatiotemporal analysis. Entry for *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology* (section editor: Mei-Po Kwan; general editor: Michael Goodchild).
4. **An, L.**, W. Yang, and J. Liu (2016). Demographic decisions and cascading consequences. Book chapter (#8) in Liu et al.: *Pandas and People: Coupling Human and Natural Systems for Sustainability*. Oxford, UK: Oxford University Press.
5. Aitken, S.C., **L. An**, S. Allison, and S. Yang (2016). Nature's legacy: Children, development and urban access in Fanjingshan, China. Chapter prepared for Murnaghan, A.M.F., and L.J. Shillington (editors): *Children, Nature, and Cities*. Ashgate Publishing Ltd.
6. Weeks, J.R., D. Stow, and **L. An** (2016). Demographics, health drivers & impacts on land cover and land use change in Ghana. Chapter for Stephen J. Walsh (ed.), *Remote Sensing Applications for Societal Benefits* (Comprehensive Remote Sensing Vol. 9), Elsevier.
7. Liu, J., V. Hull, W. Yang, A. Viña, **L. An**, N. Carter, X. Chen, W. Liu, Z. Ouyang, and H. Zhang (2016). Lessons from local studies for global sustainability. Book chapter (#18) in Liu et al.: *Pandas and People: Coupling Human and Natural Systems for Sustainability*. Oxford, UK: Oxford University Press.
8. Liu, J., V. Hull, J. Luo, W. Yang, W. Liu, A. Viña, C. Vogt, Z. Xu, H. Yang, J. Zhang, **L. An**, X. Chen, S. Li, Z. Ouyang, W. Xu, and H. Zhang (2016). Human-nature interactions over distances. Book chapter (#17) in Liu et al.: *Pandas and People: Coupling Human and Natural Systems for Sustainability*. Oxford, UK: Oxford University Press.

9. Chen, X., W. Yang, V. Hull, **L. An**, T. Dietz, K. Frank, F. Lupi, and J. Liu (2016). Social capital and social norms shape human-nature interactions. Book chapter (#11) in Liu et al.: *Pandas and People: Coupling Human and Natural Systems for Sustainability*. Oxford, UK: Oxford University Press.
10. Carter, N., **L. An**, and J. Liu (2016). Cross-site synthesis of complexity in coupled human and natural systems. Book chapter (#16) in Liu et al.: *Pandas and People: Coupling Human and Natural Systems for Sustainability*. Oxford, UK: Oxford University Press.
11. Gupta, D. K., B. Spitzberg, M.H. Tsou, **L. An**, and J. M. Gawron (in press). Of mining and mine fields revolution in paradigms of data analysis and interpretation. In L. Fenstermacher (ed): *Countering Violent Extremism: A Multidisciplinary Perspective*. Maxwell AFB, AL: Air University Press.
12. Zvoleff, A.*, S. M. Wandersee, **L. An**, and D. López-Carr (2014). Land use and land cover change. *Oxford Bibliographies*. <http://oxfordindex.oup.com/view/10.1093/obo/9780199874002-0105>
13. Aitken, S. C., **L. An**, S. Wandersee, and Y. Yang (2014). Renegotiating local values: The Case of Fanjingshan Reserve, China (book chapter). In Cathrine Brun, Piers Blakie and Mike Jones (editors): *Unravelling Marginalisation, Voicing Change: Alternative Geographies of Development*. Aldershot: Ashgate Press.
14. Zvoleff, A.*, **L. An**, J. Stoler, and J. R. Weeks (2013). What if neighbors' neighborhoods differ? The influence of neighborhood definition on health outcomes in Accra. Book chapter for *Spatial Inequalities: Health, Poverty and Place in Accra, Ghana* (editors John R. Weeks, Allan G. Hill), Springer.
15. Gupta, D., B. H. Spitzberg, M-H. Tsou, **L. An**, and J. M. Gawron (2011). Tracking the spread of violent extremism. In L. Fenstermacher & S. Canna (Eds.), *Countering Violent Extremism: Scientific Methods & Strategies* (Topical strategic multi-layer assessment [SMA] multi-agency and Air Force Research Laboratory multi-disciplinary white papers in support of counter-terrorism and counter-WMD); pp. 47-58.
16. **An, L.**, M. Linderman, Guangming He, Z. Ouyang, and J. Liu (2011). Long-term ecological effects of demographic and socioeconomic factors in Wolong Nature Reserve (China). In *Human Population: Its Influences on Biological Diversity* (Richard P. Cincotta, and L. J. Gorenflo, eds., Springer-Verlag).
17. Liu, J., **L. An**, S. S. Batie, S. Bearer, X. Chen, R. E. Groop, G. He, Z. Liang, M. A. Linderman, A. G. Mertig, Z. Ouyang, J. Qi, H. Zhang S. Zhou (2005). Beyond Population Size: Examining intricate Interactions among Population Structure, Land Use, and Environment in Wolong Nature Reserve (China). In: *Population, Land Use, and Environment – Research Directions* (report of the National Research Council, Barbara Entwisle and Paul Stern, editors, The National Academies Press, Washington, D.C.; pages 217-237).
18. Liu, J., Z. Ouyang, M. Linderman, **L. An**, S. Bearer, and G. He (2003). A new paradigm for panda research and conservation: Integrating ecology with human demography, behavior, and socioeconomics. In *Giant Pandas: Biology and Conservation* (Donald G. Lindburg and Karen Baragona, eds., University of California Press, Berkeley).
19. Liu, J., **L. An**, S. Batie, R. Groop, Z. Liang, M. Linderman, A. Mertig, Z. Ouyang, and J. Qi (2002). Human impacts on land cover and panda habitat in Wolong Nature Reserve: linking ecological, socioeconomic, demographic, and behavioral data. In *People and the Environment: Approaches for Linking Household and Community Surveys to Remote Sensing and GIS* (Jeff Fox, Vinod Mishra, Ron Rindfuss, and Steve Walsh, eds., Kluwer Academic Publishers).

PEER-REVIEWED CONFERENCE PAPERS (*Graduate students advised by Li An):

1. Gupta, D., B. Spitzberg, M. Tsou, M. Gawron, **L. An** (2015). Revolution in social science methodology and pitfalls. International Studies Association's 56th Annual Convention, February 18th-21st, 2015, New Orleans, Louisiana. http://www.isanet.org/annual_convention.
2. Tsou, M-H., D. Lusher, J-A. Yang, D. Gupta, J.M. Gawron, B.H. Spitzberg, **L. An**, and S. Wandersee (2012). Mapping social activities and concepts with social media (Twitter) and web search engines (Yahoo and Bing): A case study in 2012 U.S. presidential election. In Sarah Battersby edited, AutoCarto International Symposium on Automated Cartography Proceedings (Columbus, OH): Mt. Pleasant, South Carolina, Cartography and Geographic Information Society.
3. Wang, N.*, and **L. An** (2012). Use GeoSimulation data to assess the inferential power of statistics. GIScience 2012, September 18-21, 2012, Columbus, Ohio.
4. **An, L.** (2011). Modeling human decisions in coupled human and natural systems: review of agent-based models. Annual meeting of American Association for the Advancement of Science (AAAS), February 17-21, Washington, D.C.
5. **An, L.**, D. G. Brown, S. E. Page, and W. Rand (2005). What statistical models can better detect land-change mechanisms? (<http://www.geocomputation.org/2005/An.pdf>) The 2005 GeoComputation conference, August 1-3, 2005, Ann Arbor, Michigan.
6. Wang, N.*, and **L. An** (2010). What statistical model can better detect land-change drivers? A comparative study of survival analysis, logistic regression and multivariate linear regression. SAM Student Paper Competition (I). The 2010 AAG annual conference, April 12-16, Seattle, Washington.
7. Gawron, J.M., D. Gupta, K. Stephens, M-H. Tsou, B. H. Spitzberg, and **L. An** (2012). Using group membership markers for group identification. Paper presented and published in the Proceedings of the Sixth International AAAI Conference on Weblogs and Social Media (ICWSM) Conference, Dublin, Ireland.
8. Gawron, J. Mark, A. Dodge, M. Tsou, B. Spitzberg, and **Li An** (2016). Improving community detection with linguistic information. The North American Chapter of the Association for Computational Linguistics (NAACL), San Diego, California, June 12 to June 17, 2016.

JOURNAL PAPERS OR BOOK CHAPTERS IN REVIEW (*Graduate students advised by Li An):

1. **An, L.**, Battle, C.*, R. Lewison, J. Dai, N. Carter, J. Karki, and A. Zvoleff (in revision). Sex-specific habitat suitability models for *panthera tigris* in Chitwan National Park, Nepal.
2. Tsai, Y.*, D. Stow, H. Chen, L. Shi, R. Lewison, and **L. An** (in review). Mapping vegetation and land cover types in Fanjingshan National Nature Reserve using Google Earth Engine. *Remote Sensing of Environment*.
3. Chen, H.L., R.L. Lewison, **L. An**, Y.H. Tsai, D. Stow, L. Shi, and S. Yang (in review). Assessing the effects of payments for ecosystem services programs on forest structure and species biodiversity. *Journal of Environmental Management*.
4. Chen, H.L., R.L. Lewison, **L. An**, S. Yang, L. Shi, W. Zhang (in review). Effects of payments for ecosystem services programs on human activity and wildlife diversity in montane forests of China. *Forest Ecology and Management*.
5. Yang, S*., A. Zvoleff, D. López-Carr, and **L. An** (in review). Where do we go now? Modelling housing preference of post-disaster resettlers with livelihood sustainability concerns. *Stochastic Environmental Research and Risk Assessment*.
6. Yang, S*., **L. An**, R. Bilsborrow, D. Lopez-Carr, Jie Dai, Weiyong Zhang, and Lei Shi (in review). What influences local people's decisions to migrate under payments for Ecosystem Services (PES). *Anthropocene*.

7. Tang, W., V. Grimm, L. Tesfatsion, E. Shook, D. Bennett, **L. An**, Z. Gong, and X. Ye (in review). Code reusability and transparency of agent-based modeling: perspectives and challenges. *Annals of Association of American Geographers*.

PEER-REVIEWED PAPERS IN PREPARATION (*Graduate students advised by Li An):

1. **An, L.**, M. Tsou, T.P. Evans, B. Spitzberg, J. Dai*, and N. Wang* (in preparation). Climate change: Who cares? (Tentative title).
2. **An, L.**, S. Yang*, J. Liu, R. Lewison, H. Chen, L. Shi, X. Chen, W. Xu, and W. Zhang (in preparation). Detraction among concurrent payments for ecosystem services: Global policy implications.
3. **An, L.**, A. Nara, K. Huang, G. He, D.A. Stow, and J.R. Weeks (in preparation). Unpacking space-time dynamics from multi-time (non-longitudinal) spatial data.
4. Yang, S*, **L. An**, J. Mak, L. Shi, and W. Zhang (in preparation). Understanding demographic and livelihood decision making in Fanjingshan National Nature Reserve, China: An integrated ABM approach.
5. Dai, J., S. Yang, R. Bilsborrow, L. Shi, W. Zhang, M. Wang, and **L. An** (in preparation). Neighborhood effects on out-migration of individual households in Fanjingshan National Nature Reserve, China.
6. Shih, H., D. Stow, **L. An**, et al. (in preparation). Exploring eigenvector spatial filter in latent trajectory modeling for space-time analysis: A case study of southeastern Ghanaian women's BMI.
7. Yost, A., **L. An**, S. Yang, J. Dai, et al. (in preparation). Connecting post-enrollment land use to efficacy of payments for ecosystem services.

OTHER PAPERS IN PREPARATION OR IN REVIEW (*Graduate students advised by Li An):

[None for now]

PRESENTATIONS (As single or 1st-author)

Available upon request.

PAST HONORS & AWARDS (By 2009)

- Research on human-environment interaction in the golden money reserve has been reported by San Diego State University Website (front page) and The 360 Magazine (The Magazine of San Diego State University) in 2009.
- Gill-Chin Lim Award for Outstanding Doctoral Dissertation in Global Studies, Michigan State University (2004).
- Dissertation Completion Fellowship for outstanding dissertations from College of Agriculture and Natural Resources, Michigan State University (2002).
- Thoman Fellowship from International Studies & Programs Office, designed for international students excellent in studies and research, Michigan State University (2001).
- Research Enhancement Fellowship from Michigan State University and Department of Fisheries and Wildlife, for "Workshop on Linking Household and Remotely Sensed Data: Methodological and Practical Problems, Honolulu, Hawaii" (2002).

- Travel Grant from Michigan State University, for the international Conference “Panda 2000: Conservation Priorities for the New Millennium, San Diego, CA” (2000).
- NASA-MSU Scholarship in Landscape Ecology from the National Aeronautics and Space Administration (NASA) and Michigan State University (1998).

PROFESSIONAL MEMBERSHIPS

- American Association for the Advancement of Science (AAAS)
- Association of American Geographers (AAG)
- Population Association of America (PAA)
- International Association for Landscape Ecology (IALE), US Chapter
- The International Association of Chinese Professionals in Geographic Information Sciences (CPGIS; lifetime member)

TEACHING AND MENTORING

COURSES

1. Quantitative Methods in Geographic Research (GEOG 585; Upper Division Undergraduate and Graduate Course)
 - Application of statistical techniques to geographic research. Simple and multiple regressions, correlation, classification, factor analysis and principle component analysis, spatial statistics, geographically weighted regression (GWR).
 - Lectures, labs, home assignments, exam, and project.
2. Spatial Data Analysis (GEOG 385; Lower Division Undergraduate Course)
 - Analysis of spatially distributed data including computer applications. Spatial sampling, spatial descriptive statistics for point and areal data, inferential statistics, use of maps in data analysis.
 - Lectures, home assignments, and exams.
3. Landscape Modeling and Simulation (GEOG 780; Graduate Course)
 - Exploration of various approaches to modeling and simulating landscape patterns and processes driven by (or related to) human and ecological processes: terrain modeling, logistic regressions in habitat analysis, cellular automata models, Markov chain models, survival analysis, agent-based modeling, and spatial model validation.
 - Lectures, labs, home assignments, and a project.
4. Landscape Ecology (GEOG 506, previously GEOG 596; Upper Division Undergraduate and Graduate Course)
 - Theories, techniques, and frontiers in landscape ecology, applications of landscape ecology in natural resources/environmental planning, management, and conservation: metrics of landscape patterns, neutral models, causes of landscape patterns; disturbance, ecosystem processes, human road systems, meta-populations, landscape connectivity, restoration.
 - Lectures, class presentations, final paper.

5. Geographic Information Science (GEOG 104; Lower Division Undergraduate Course)
 - Fundamental concepts of geographic information science (GIScience), including remote sensing, geographic information systems (GIS), global positioning systems (GPS), cartography, and spatial analysis.
6. Understanding the Chinese World (AS 150; Lower Division Undergraduate Course; team-teaching with about other colleagues)
 - The traditions of Chinese civilization (the culture, geography, languages, philosophies, arts, history, politics, demographics, business practices, and environmental concerns) and their contemporary transformations through multiple disciplines and approaches.

ADVISING

- Postdoctoral fellows: Dr. Hsiang Ling Chen (co-advisor: Dr. Rebecca Lewison, SDSU Department of Biology)
- Ph.D. students: Sarah Wandersee (2013; Committee: David López-Carr as co-advisor, Kathleen Farley, Keith Clarke), Alex Zvoleff (2013; Committee: David López-Carr as co-advisor, Kathleen Farley, Bodo Bookhagen), Ninghua Wang (2013; Committee: Helen Couclelis, Keith Clarke, André Skupin), Shuang Yang (Committee: Piotr Jankowski, David Lopez-Carr, Keith Clarke), Jie Dai (Committee: Douglas Stow, Dar Roberts).
- M.S. students: Susan Whitford (2008), Jennifer Vaughan (2010), Kristin Meseck (2013), Curtis Battle (2016), William Orihuela, Jeanne Patton (co-advised with John O’Leary), Judy Mak, Alexandra Yost.
- As doctoral student committee member: Arika Ligmann-Zielinska (2008), Mary Freeman (2012), Justin Stoler (2012), Xinyue Ye (2009), Abigail Sullivan (Arizona State University; 2016), Yu Hsin (Cindy) Tsai.
- As M.S./M.A. committee member: Jing-Yi Chen (2006), Sarah Hinton (2007), Xuening Li (2007), Mersee J. Madison_Villar (Biology; 2007), Hua Liu (Civil and Environmental Engineering; 2007), Anna Mittelberg (Biology; 2008), Wyson Pang (2008), Adam Wagschal (2009), Kira Withy-Allen (Biology; 2009), Wei Chen (Statistics; 2009), Jeffrey LaMantia-Bishop (2010), Jeanie Gaudette (2010), Jeremy Hamm (2010), Kelly Tait (Biology; 2010), Alexander Gaos (Biology; 2011) , Heather D’Anna (Biology; 2011), Danna Hinderle (Biology; 2011), Bradley McDonald (Biology; 2011), Doug Wylie (2012), Daniel Lusher (2013), Joelle Andrews (Biology; 2013), Kalee Koeslag (Biology), Julia Smith (Biology).

INVITED OR GUEST LECTURES

- Invited lecture entitled "Payments for Ecosystem Services (PES): 1 + 1 < 2?" at the SDSU Discovery Slam (organized by Stephen Welter, SDSU Vice President for Research and Dean of Graduate Affairs), February 22, 2017.
- Invited lecture entitled “Agent-based modeling of the impact of social norms on PES effectiveness” for GEOG 694, Portland State University, March 5, 2015, 10:00 - 11:50 am, Cramer Hall 409, Portland, Oregon.

- Invited workshop on agent based modeling for The American Society for Photogrammetry and Remote Sensing (ASPRS) PSU chapter, Portland State University, March 5, 2015, 2:00 - 3:30 pm, MCB 123, Portland, Oregon.
- Invited lecture (part of the IGERT program) entitled “Payments for ecosystem services: Always a path toward sustainability?” ESM 507, Portland State University, March 5, 2015, 4:00 - 5:00 am Portland, Oregon.
- Invited presentation “People, pandas, and tigers: Mutual influences crossing the border”, at the 2014 Outstanding International Scholar Award reception, March 6, 2014, Scripps Cottage, San Diego State University.
- Invited lecture “All is about time: Latent trajectory models for space-time analysis”, the 2nd International Conference on CyberGIS and Geodesign (CyberGIS’14) and Redlands, August 19-21, 2014.
- Invited poster “The Clock is Ticking for the Golden Monkeys” (An, L and S. Yang) to introduce the NSF Project *CNH: Impacts of Payments for Ecosystem Services in Coupled Natural and Human Systems*, September 11, 2013 (invited by SDSU President Elliot Hirshman, Vice President for Research Steve Welter, and Dean of College of Arts and Letters Paul Wong).
- Invited panelist (travel award from the Dr. Anne Chin’s NSF Grant) in the NSF-sponsored Workshop *Landscapes in the “Anthropocene”: Exploring the Human Connections*, University of Oregon, March 4-6, 2010.
- Guest lectures for the *Seminar in Development of Geographic Thought* (GEOG 701) at San Diego State University in 2005, 2006, 2007, 2008, 2013, 2016, and 2017.
- Guest lectures for GEOG 395 *Introduction to The Major* at San Diego State University from 2014 to 2017.
- Guest lectures for *Conservation Ecology* (BIOL 540) “understanding the impact of human activities on the Guizhou golden monkey habitat: A complex systems approach” at San Diego State University in 2009 and 2013.
- Invited colloquium at Department of Geography, University of California Santa Barbara: “Did the model or data lie to us? Pseudo-history survival analysis in Lucca”, January 15, 2009, Santa Barbara, California.
- Invited seminar “Exploring landscape complexity: patterns, processes, and dynamics” in 2006 at Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences.
- Guest lecture for the 2005 GIS day at San Diego State University in 2005 fall: “Human-environment complexity: What can GIS and agent-based modeling help with?”
- Guest lecture for the course *International Forestry* (FOR 450) at Michigan State University in 2002 fall: “Simulating spatio-temporal dynamics of households, forests, and their interactions in Wolong Nature Reserve for giant pandas”.
- Guest lecture for the course *Ecological Problem Solving* (FW 364) (April 22, 2002): “Simulating demographic and socioeconomic processes on household level using STELLA”.
- Guest lecture for the course *International Forestry* (FOR 450) at Michigan State University in 2001 fall: “Integrating socioeconomic, ecology, and computer modeling in habitat research and wildlife conservation—case study: simulating demographic and socioeconomic processes on household level and their impacts on giant panda habitats”.

INVITED CONFERENCE PARTICIPATION

- Invited participation in the Workshop on *Agent-Based Modeling of Complex Spatial Systems*, Santa Barbara, California, National Center for Geographic Information and Analysis, April 14-16 2007 (workshop sponsor: Dr. Michael Goodchild).
- Invited participation in an NIH-supported Roadmap Workshop, May 17-19, 2006 in Honolulu at the East-West Center.
- Invited investigator in an NIH-supported Roadmap Workshop, April 27-29, 2005, Chapel Hill at University of North Carolina (Co-organizers: Ronald Rindfuss and Steve Walsh). Topics: (1) the advantages and disadvantages of different modeling approaches in land-change science; (2) linking social and spatial data; and (3) developing a meta-data collection, integration, and analysis protocol to facilitate multi-site comparison, multi-disciplinary integration, and multi-level geospatial analysis.

SERVICE

DEPARTMENT SERVICE

- Internal Resources Committee (2005 - 2006; 2008 – 2010; as chair 2010 – 2011; 2016-2018).
- Speakers and Community Relations Committee (2005 – 2006; as chair 2006 – 2007).
- Speakers Committee (as chair 2013 - 2014).
- Personnel Committee (2014-2015).
- Master’s Advising Committee member (2007- 2010).
- Curriculum Committee member (2007- 2010).
- Computing Committee member (2010 – 2013; 2014-2015) and chair (2016 – 2017).
- Student Outcomes Committee member (2010- 2011)

COLLEGE, UNIVERSITY, AND COMMUNITY SERVICE

- SDSU Faculty Statutory Grievance Hearing Committee (ad hoc committee; 2017)
- SDSU Committee for the Master of Science in Big Data Analytics program (2015-2016)
- SDSU Student Research Symposium Committee (2008 – 2011)
- The College of Arts and Letters (CAL) Research Committee (2015-2016)
- Chinese Study Institute, SDSU College of Arts and Letters
- Member of SDSU Confucius Institute
- Member of the San Diego GIS force group
- Advisor/Co-advisor of SDSU Chinese Students & Scholars Association, 2009-present.

SERVICE IN PROFESSIONAL COMMUNITIES

- Co-organizer (with Eric Shook) and chair of Panel Session “Agent-based Modeling: Challenges and Opportunities” (panelists: Steven M. Manson, Wenwu Tang, Dawn C. Parker, Tom Evans), 12:40 pm - 2:20 pm in Suffolk, Marriott, Boston, the 2017 Annual meeting of the Association of American Geographers, April 5, 2017, Boston, Massachusetts.
- Scientific Steering Committee member of The International Society for Ecological Modeling Global Conference 2016 (8-12 May 2016, Baltimore, Maryland) and organizer of the symposium titled “Modeling human behaviors/decisions and their impacts on the environment”.

- Scientific Advisory Board member of the GeoComputation 2015 Conference, May 20-23, 2015, Dallas, Texas, USA.
- Program Committee of the 23rd International Conference on Geoinformatics (Geoinformatics 2015), co-organized by China University of Geosciences and The International Association of Chinese Professionals in Geographic Information Sciences (CPGIS), June 19-21, 2015, Wuhan, China.
- Program Committee of The Second International Conference on CyberGIS and Geodesign (CyberGIS'14) and invited presentation *All is about time: Latent trajectory models for space-time analysis*, Redlands, August 19-21, 2014.
- Invited panelist for Science with CyberGIS at The NSF-funded CyberGIS Project All-Hands Meeting on September 15-16, 2013, Seattle, Washington.
- Panelist in Session 4584: NSF IGERT, GK-12, PIRE, REU, and GDEP Grants: Strategies for successful proposals and projects that can boost your research and strengthen your department. The 2011 Annual Meeting of the Association of American Geographers, April 12-16, 2011, Seattle, Washington.
- Co-organizer and co-chair of Sessions “Payments for Ecosystem Services: Paths toward Sustainability—I (2102) and II (2611)”, April 10, 2013, The 2013 Annual meeting of The Association of American Geographers, Los Angeles, California.
- Organizer and speaker of 2011 The American Association for the Advancement of Science (AAAS) symposium "Mapping and disentangling human decisions in complex human-nature systems", Feb. 17-21, 2011, Washington, D.C.
- Judge for the Spatial Analysis and Modeling Specialty Group Student Paper Competition, Annual meetings for the Association of American Geographers, 2011-2015.
- Organizer of Session 5108 “Perspectives on Geographic Complexity I: Theory”, April 19, 2008, The 2008 Annual meeting of The Association of American Geographers, Boston, Massachusetts.
- Chair of Session 5408 “Perspectives on Geographic Complexity III: Applications I—Land Use”, April 19, 2008, The 2008 Annual meeting of The Association of American Geographers, Boston, Massachusetts.
- Chair of Session “Species in urban landscapes”, April 10, 2007 the 22nd Annual Symposium of the International Association for Landscape Ecology (IALE), US Chapter, Tucson, Arizona.
- Chair of Session “Habitat models”, March 31, 2006 in The 21st Annual Symposium of the International Association for Landscape Ecology (IALE), US Chapter. San Diego, California.

PROFESSIONAL ORGANIZATIONS

- Chair of Spatial Analysis and Modeling (SAM) Specialty Group (elected), the Association of American Geographers, 2012-2015.

EDITORIAL SERVICE

- Member of the Editorial Board of the *Annals of the American Association of Geographers*, the flagship journal in geography (2013-present).
- Member of the Editorial Advisory Board of *Ecological Modelling*, an international journal on ecological modelling and systems ecology (2013-present).
- Member of the Editorial Board of *International Journal of Geospatial and Environmental Research* (IJGER; 2013-present).
- Member of the Editorial Board of a book series (in Chinese): *Fanjingshan Moss* (Yuanxin Xiong and Lei Shi, 2014; Guizhou Science and Technology Press), *China's Fanjingshan Fungi* (Xingliang Wu et al.,

2014; China Science and Technology Press); *Chinese Medicinal Herbs in Fanjingshan* (Chuangdong Yang, Lei Shi, and Xiaoping Lei, 2016; Guizhou Science and Technology Press); *Birds at Fanjingshan* (Zhongfan Kuang, Kefeng Niu, 2017; Guizhou Science and Technology Press).

- Guest-editor of a special issue entitled "Mapping and disentangling human decisions in complex human-nature systems" for the journal *Ecological Modelling* (2012).

SERVICE AS GRANT PROPOSAL REVIEWER AND PANELIST

National Geographic Society (2007); NSF Geography and Regional Science (GRS; now Geography and Spatial Science) and Anthropology Programs (2006 – 2010); The Managed Ecosystem Panel of USDA's National Research Initiative program (2007). The United Nations Environment Programme's Global Environment Outlook Series (Geo-5; 2011); NSF Geography and Spatial Science (GSS) program's Doctoral Dissertation Research Improvement Program (2011-2013), Hong Kong Research Grants Council (2010-2013), NSF Coupled Natural and Human (CNH) Program's Proposal Review Panel (2015).

REVIEWER FOR TENURE OR PROMOTION

- The University of Texas at Dallas (School of Economic, Political and Policy Sciences; 2014)
- University of Waterloo (School of Planning; 2015)
- University of Tennessee (Department of Geography; 2016)
- Virginia Polytechnic Institute and State University (also known as Virginia Tech; Department of Geography, 2016)

PAPER REVIEW FOR PEER-REVIEWED JOURNALS (alphabetical order)

Acta Ecologica Sinica
Annals of Association of American Geographers
Computers, Environment and Urban Systems
Ecological Modelling
Ecology and Society
Environmental Management
Environmental Modelling & Software
Environment & Planning B
GeoJournal
Geographical Analysis
International Journal of Geographical Information Science
International Journal of Geospatial and Environmental Research
International Regional Science Review
Journal of Geographical Systems
Journal of Plant Ecology
Landscape Ecology
Photogrammetric Engineering and Remote Sensing
Plant Ecology
PLOS ONE
Professional Geographer

Population and Environment
Stochastic Environmental Research & Risk Assessment
Proceedings of National Academy of Sciences

BOOK PROPOSAL REVIEW FOR PUBLISHERS

Higher Education Press (China)