

# Paul C. Sutton

**Professor of Geography**  
**Department of Geography and the Environment**  
**University of Denver**

## Appointments

1999 - Present	Department of Geography at the University of Denver Professor (2012 - Present) Assoc.(2005-2012) Asst.(1999 - 2005)
2015 - 2016	Head of Discipline: Env & Geospatial Sciences (UNISA)
2012 - 2013	Barbara Hardy Institute Senior Research Fellow (UNISA)
2005 - 2006	School of Geography, Population, & Environmental Mgmt Visiting Research Fellow (Flinders University)
1995 - Present	National Geophysical Data Center of NOAA in Boulder CO Research Associate
1992-1999	Department of Geography, University UCSB Lecturer, Graduate Student Researcher, and Teaching Assistant
1983-1993	Anacapa High School (Physics, Chemistry, & Math Teacher)
1984-1992	Process Engineer with Santa Barbara Research Center

## Engagement & Service

- Elected to Board of Trustees in Morrison, CO (2018-2022)  
(7 member board oversees \$4 million annual budget)
- Human Planet Initiative (part of GEO Strategic Plan)  
(member of steering committee approved at GEO-XII)
- Global Human Settlement Layer Working Group  
(Joint Research Center of the European Union in Ispra Italy)
- UNEP's Global Environmental Outlook 6 GEO6 (2014-16)
- Australia Council of Environmental Deans & Dirs (2015-16)
- ELD Economics of Land Degradation Working Group (2014-15)
- Australia New Zealand Society for Ecological Economics (2015-17)  
(member of executive board and chair of conference committee)
- Chair of Academic Program Review Team for the Department of Geography at Texas State University in San Marcos, Texas. (2013)
- President of the Advisory Board for evaluation of the Master in Geospatial Science and Technology at the Polytechnic University of Puerto Rico for the Government of Puerto Rico (2012)
- Prg Com of GIScience 2014 & 2010 Sept the 14-17th in Zurich
- Proposal & Manuscript Reviewer for various scientific foundations & journals (NSF, NASA, ESA, ESF, ARC)
- Invited Keynote speaker at various functions sponsored by various government, public, and environmental organizations.

## Education

PhD Geography	(1999)
University of California at Santa Barbara	Dissertation: 'Census from Heaven'
M.A. Applied Statistics	(1997)
University of California at Santa Barbara	
M.A. Geography	(1995)
Thesis: 'Public Opinion of Population Issues'	
B.S. Chemistry	(1983)
Union College in Schenectady, New York	

## Research Agenda

*Conduct empirically validated work in collaboration with scientists, policy makers, and the public to chart a path to a sustainable and desirable future. Research areas include:*

- Population Geography
- Sustainability Science
- Ecological Economics
- Integration of Remote Sensing & GIS
- Ecosystem Services
- Integrated Assessment
- Urban metabolism and Smart Cities
- Green Infrastructure
- Urban Ecology
- Land Degradation
- Applications of Nighttime Satellite imagery

## Media & Public Outreach

- Valuing Nature – Engaging Ideas Forum  
<https://www.du.edu/ideas/interview-videos/valuing-nature.html#>
- A modest proposal: 'Kill all the bees'  
<http://theconversation.com/if-dollars-rule-the-world-why-dont-the-bees-get-a-bailout-38384>
- 'Planet Talk' at WOMAD in Adelaide  
<https://www.youtube.com/watch?v=GvJHAEp8q50&feature=youtu.be>
- Why a pop of 15 million makes sense for Australia  
<https://www.theguardian.com/business/2017/jul/11/why-a-population-of-say-15-million-makes-sense-for-australia>

## HONORS AND AWARDS

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Best Poster Award at the World Geospatial Forum Hyderabad, India (2011)  
Outstanding Faculty Member Award (Gamma Theta Upsilon 2003 & 2008)  
Provost's Award for Best Sabbatical Proposal (\$2,500) (2005)  
John I. Davidson President's Award for Best Practical Paper (2<sup>nd</sup> Place) (2005)  
Award for Best Scientific Paper in Remote Sensing (3<sup>rd</sup> Place) (2005)  
Boeing ASPRS Award for best paper in Image Analysis (1<sup>st</sup> Place) (2004)  
UCSB Geography Department Excellence in Research Award (\$1,000) (1998)  
NASA Earth System Science 'Mission to Planet Earth' Fellowship (1997-99)  
Dixon Ryan Fox Scholar at Union College (Full Academic Scholarship 1979-83)

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## FUNDED RESEARCH

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From Salt to C: Carbon Sequestration through ecological resotation at the Dry Creek Salt Field (\$22,600 AUD 2017 - Project # CA-16-08 Goyder Foundation)

Evaluation of Field Campaign to the Panchabhuta Conservation Foundation (\$15,000, 2015) Jointly funded by the School of Natural and Built Environments at UniSA and the Panchabhuta Conservation Foundation ( <http://panchabhuta.org/> ) (PI)

Soil Salinity Mapping and Monitoring Using Remote Sensing Technolgy (\$45,000, 2015) Research Themes Investment Scheme – University of South Australia (Co-PI)

(Foresight Global Environmental Migration Project (\$15,000, 2010) Co-Investigator with Robert Costanza quantifying change to ecosystem services in low lying coastal zones

Data Mining the 'Making Connections – Denver' Survey Data (\$10K Annie E. Casey Foundation (2008))

Geographic Information Science: Curriculum Assessment and Revision with Outreach Workshops (\$11K; 2007) Internal grant From University of Denver's (DU) Center for Teaching & Learning

"Brownsville by Bus" (\$25 K; 2005) DU Marsico course development and implementation grant with Matthew Taylor ( <http://www.geography.du.edu/sutton/Brownsville/index.htm> )

Tamarisk Mapping Project (\$3,000; 2003) Colorado Dept. of Agriculture. Provide GIS mapping and Survey services to Eric Lane (CO state weed coordinator) Dept. of Ag

E-Learning in the Geo-Sciences (\$25,000; 2002) DU's Center for Teaching & Learning This was a grant in which I participated by developing and evaluating a 'E- Learning' course for our Intro to GIS course.

Mapping Air Quality in the National Park System (\$125,000; 2000-2001) National Park Service - This research involved assembling point data from air quality monitoring networks (NADP, Ozone, and specific NPS networks), interpolating measurements across the conterminous U.S. using simple Kriging and IDW, cross-validating results, and posting maps via ArcIMS on the web ( [http://www2.nature.nps.gov/ard/gas/airatlas-du/viewer\\_index.htm](http://www2.nature.nps.gov/ard/gas/airatlas-du/viewer_index.htm) )

## PUBLICATIONS

Google Scholar Statistics (April 2018) Total Citations: 30,348 h-index 39 i10 index 58  
Google Scholar Site: <http://scholar.google.com/citations?user=cpIEVLkAAAAAJ&hl=en>

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Li, F., Sutton, P., & Nouri, H. (2018). **Planning Green Space for Climate Change Adaptation and Mitigation: A Review of Green Space in the Central City of Beijing.** *Urban and Regional Planning*, 3(2), 55.

Nouri, H., Borujeni, S. C., Alaghmand, S., Anderson, S. J., Sutton, P. C., Parvazian, S., & Beecham, S. (2018). **Soil Salinity Mapping of Urban Greenery Using Remote Sensing and Proximal Sensing Techniques; The Case of Veale Gardens within the Adelaide Parklands.** *Sustainability*, 10(8), 1-14.

Coscieme, L., Niccolucci, V., Giannetti, B. F., Pulselli, F. M., Marchettini, N., & Sutton, P. C. **Implications of Land-Grabbing on the Ecological Balance of Brazil.** *Resources* 7(44) 2-10

Sandhu, H., Clarke, B., Baring, R., Anderson, S., Fisk, C., Dittmann, S., ... & Costanza, R. (2018). **Scenario planning including ecosystem services for a coastal region in South Australia.** *Ecosystem Services*, 31(PA), 194-207.

Pitman, S. D., Daniels, C. B., & Sutton, P. C. (2018). **Characteristics associated with high and low levels of ecological literacy in a western society.** *International Journal of Sustainable Development & World Ecology*, 25(3), 227-237.

de Groot, R., Costanza, R., Braat, L., Brander, L., Burkhard, B., Carrascosa, J. L., ... & Hein, L. (2018). **Ecosystem Services are Nature's Contributions to People: Response to: Assessing nature's contributions to people.** *Science Progress*, 359(6373).

Pitman, S. D., Daniels, C. B., & Sutton, P. C. (2018). **Ecological literacy and psychographics: lifestyle contributors to ecological knowledge and understanding.** *International Journal of Sustainable Development & World Ecology*, 25(2), 117-130.

Pitman, S. D., Daniels, C. B., & Sutton, P. C. (2018). **Ecological literacy and socio-demographics: who are the most eco-literate in our community, and why?.** *International Journal of Sustainable Development & World Ecology*, 25(1), 9-22.

Costanza, R., de Groot, R., Braat, L., Kubiszewski, I., Fioramonti, L., Sutton, P., ... & Grasso, M. (2017). **Twenty years of ecosystem services: how far have we come and how far do we still need to go?.** *Ecosystem Services*, 28, 1-16.

Anderson, S. J., Ankor, B. L., & Sutton, P. C. (2017). **Ecosystem service valuations of South Africa using a variety of land cover data sources and resolutions.** *Ecosystem Services*, 27, 173-178.

Jadhav, A., Anderson, S., Dyer, M. J., & Sutton, P. C. (2017). **Revisiting ecosystem services: Assessment and valuation as starting points for environmental politics.** *Sustainability*, 9(10), 1755.

Kubiszewski, I., Costanza, R., Anderson, S., & Sutton, P. (2017). **The future value of ecosystem services: global scenarios and national implications.** *Ecosystem Services*, 26, 289-301.

Hamideh Nouri, Sharolyn Anderson, Paul Sutton, Simon Beecham, Pamela Nagler, Christopher J. Jarchow, Dar A. Roberts (2017) **NDVI, scale invariance and the modifiable areal unit problem: An assessment of vegetation in the Adelaide Parklands** Science of The Total Environment, Volumes 584-585, 15 April 2017, Pages 11-18, ISSN 0048-9697,  
<http://dx.doi.org/10.1016/j.scitotenv.2017.01.130>.

Luca Coscieme, Paul C. Sutton, Sharolyn Anderson, Qing Liu & Christopher D. Elvidge (2017) ***Dark Times: nighttime satellite imagery as a detector of regional disparity and the geography of conflict*** *GIScience & Remote Sensing*, 54:1, 118-139, DOI: 10.1080/15481603.2016.1260676

Ward James D, Sutton Paul C, Werner Adrian D, Costanza Robert, Mohr Steve H, Simmons Craig T (2016) ***Is Decoupling GDP Growth from Environmental Impact Possible?*** *PLoS ONE* 11(10): e0164733. doi:10.1371/journal.pone.0164733

Sutton, Paul C; Anderson, Sharolyn J; Costanza, Robert: and Kubiszewski, Ida (2016) ***The ecological economics of land degradation: Impacts on ecosystem service values*** *Ecological Economics* Vol 129 pp 182-192

Sutton, Paul C and Anderson, Sharolyn J (2016) ***Holistic valuation of urban ecosystem services in New York City's Central Park***, *Ecosystem Services*, Volume 19, June 2016, Pages 87-91, ISSN 2212-0416, <http://dx.doi.org/10.1016/j.ecoser.2016.04.003>.

(<http://www.sciencedirect.com/science/article/pii/S2212041616300729>)

Nouri, H., Glenn, E. P., Beecham, S., Chavoshi Boroujeni, S., Sutton, P., Alaghmand, S., ... & Nagler, P. (2016). ***Comparing Three Approaches of Evapotranspiration Estimation in Mixed Urban Vegetation: Field-Based, Remote Sensing-Based and Observational-Based Methods***. *Remote Sensing*, 8(6), 492.

Katrine Grace Turner, Sharolyn Anderson, Mauricio Gonzales-Chang, Robert Costanza, Sasha Courville, Tommy Dalgaard, Estelle Dominati, Ida Kubiszewski, Sue Ogilvy, Luciana Porfirio, Nazmun Ratna, Harpinder Sandhu, Paul C Sutton, Jens-Christian Svenning, Graham Mark Turner, Yann-David Varennes, Alexey Voinov, Stephen Wratten (2016) ***A review of methods, data, and models to assess changes in the value of ecosystem services from land degradation and restoration*** *Ecological Modelling* Volume 319 pp 190-207

Kubiszewski, I., Anderson, S. J., Costanza, R., and Sutton, P. C. (2016) ***The Future of Ecosystem Services in Asia and the Pacific***. *Asia & the Pacific Policy Studies*, doi: [10.1002/app5.147](https://doi.org/10.1002/app5.147).

Robert Costanza, Ralph d'Arge, Rudolf De Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahid Naeem, Robert V O'Neill, Jose Paruelo, Robert G Raskin, Marjan Van den Belt, Paul Sutton (2016) ***The Value of the World's Ecosystem Services and Natural Capital (1997)*** in *The Globalization and Environment Reader* John Wiley and Sons

Luca Coscieme, Federico M Pulselli, Valentina Niccolucci, Nicoletta Patrizi, Paul C Sutton (2016) ***Accounting for "land-grabbing" from a biocapacity viewpoint*** *Science of the Total Environment* Volume 539 pp 551-559

Amir S Siraj, Menno J Bouma, Mauricio Santos-Vega, Asnakew K Yeshiwondim, Dale S Rothman, Damtew Yadeta, Paul C Sutton, Mercedes Pascual (2015) ***Temperature and population density determine reservoir regions of seasonal persistence in highland malaria*** *Proceedings of the Royal Society B* Volume 282 (1820)

Federico M Pulselli, Luca Coscieme, Laura Neri, Andrea Regoli, Paul C Sutton, Achille Lemmi, Simone Bastianoni (2015) ***The world economy in a cube: A more rational structural representation of sustainability*** *Global Environmental Change* Volume 35 pp 41-51

Tuttle BT, Anderson S, Elvidge C, Ghosh T, Baugh K, Sutton P. (2014) ***Aladdin's Magic Lamp: Active Target Calibration of the DMSP OLS***. *Remote Sensing*. 6(12):12708-12722.

Joseph H. Hoover, Paul C. Sutton, Sharolyn J. Anderson, Arturo C. Keller. (2014) ***Designing and evaluating a groundwater quality Internet GIS***, *Applied Geography*, Volume 53, September 2014, Pages 55-65, ISSN 0143-6228



Robert Costanza, Rudolf de Groot, Paul Sutton, Sander van der Ploeg, Sharolyn J. Anderson, Ida Kubiszewski, Stephen Farber, R. Kerry Turner (2014) ***Changes in the global value of ecosystem services*** Global Environmental Change Volume 26, May 2014, Pages 152-158, ISSN 0959-3780,

Coscieme, Luca; Pulselli, Federico; Bastianono, Simon; Elvidge, Christopher; Anderson, Sharolyn; Sutton, Paul (2013) ***A Thermodynamic Geography: Night-Time Satellite Imagery as a Proxy of Measure of Emergy***. Ambio December, 2013 pp 1-11

Coscieme, Luca; Pulselli, Federico; Marchettini, Nadia; Sutton, Paul C.; Anderson, Sharolyn; Sweeney, Sharlynn (2013) ***Emergy and Ecosystem Services: A national biogeographical assessment*** Ecosystem Services (<http://www.sciencedirect.com/science/article/pii/S2212041613000892>)

Anderson, Sharolyn; Nuernberger, Sarah; Yamamoto, Kristina; Sutton, Paul C. (2013) ***Evaluating the compliance of Seat Turtle Light Ordinances in Florida Using Remote Sensing*** Geography Compass 7(12) pp 867-878

Ghosh, Tilottama; Anderson, Sharolyn j.; Elvidge, Christopher; Sutton, Paul C. (2013) ***Using Nighttime Satellite Imagery as a Proxy Measure of Human Well-Being*** Sustainability 5(12) pp 4988-5019

Benjamin Tuttle, Sharolyn J. Anderson, Paul C. Sutton, Christopher D. Elvidge, Kimberly Baugh (2013) ***It Used To Be Dark Here: Geolocation Calibration of the Defense Meteorological Satellite Program Operational Linescan System*** Photogrammetric engineering and remote sensing 79 (3), 287-297

Sutton, Paul C. (2012). ***Alone in the Void: Getting Real about the Tenuous and Fragile Nature of Modern Civilization***. Humanities 1, no. 3: 178-191.

Morse, Lauren K.; Powell, Rebecca L; Sutton, Paul C. (2012) ***Scampering in the city: Examining attitudes toward black-tailed prairie dogs in Denver, Colorado*** Applied Geography, 2012

Elvidge, C. D., Baugh, K. E., Anderson, S. J., Sutton, P. C., and Ghosh, T.: (2012) ***The Night Light Development Index (NLDI): a spatially explicit measure of human development from satellite data***, Social Geography, 7, 23-35, doi:10.5194/sg-7-23-2012, 2012.

Kristina H. Yamamoto, Sharolyn J. Anderson, Rebecca L. Powell Donald G. Sullivan, Paul C. Sutton (2012) ***Using LiDAR to Quantify Topographic and Bathymetric Details for Sea Turtle Nesting Beaches in Florida*** Remote Sensing of Environment Ref.: RSE-D-12-00070R2 Volume 125 October 2012 Pages 125-133

Kristina H. Yamamoto, Sharolyn J. Anderson, Rebecca L. Powell Donald G. Sullivan, Paul C. Sutton (2011). ***Identifying Similar Biophysical Characteristics among Nesting Beaches of Green Turtles of Turkey Using Remote Sensing Techniques***, International Journal of Remote Sensing Applications, pp.22-29, Pub. Date: 2011- 12-31, Download: 31, www.ijrsa.org.

Sutton, Paul; Anderson, Sharolyn; Tuttle, Benjamin; Morse, Lauren (2011) ***The real wealth of nations: Mapping and monetizing the human ecological footprint*** Ecological Indicators ISSN 1470-160X, DOI: 10.1016/j.ecolind.2011.03.008.

Whalley, Brian; Saunders, Angharad; Lewis, Robin; Buenemann, Michela; Sutton, Paul (2011) ***Curriculum Development – producing geographers for the 21st Century*** Journal of Geography in Higher Education 35(3)

Costanza, Robert; Kubiszewski, Ida; Roman, Joe; Sutton, Paul (2011) ***Changes in ecosystem services and migration in low-lying coastal areas over the next fifty years*** FORESIGHT Global Environmental Migration project – a report for the UK Government’s Chief Scientific Advisor Sir John Beddington <http://www.bis.gov.uk/foresight>

Anderson, Sharolyn J. , Tuttle, Benjamin T. , Powell, Rebecca L. and Sutton, Paul C. (2010) **'Characterizing relationships between population density and nighttime imagery for Denver, Colorado: issues of scale and representation'**, International Journal of Remote Sensing, 31: 21, 5733 — 5746

Ghosh, Tilottama, Christopher D. Elvidge, Paul C. Sutton, Kimberly E. Baugh, Daniel Ziskin and Benjamin T. Tuttle (2010) **Creating a Global Grid of Distributed Fossil Fuel CO2 Emissions from Nighttime Satellite Imagery** Energies , 3(12), 1895-1913; doi:10.3390/en3121895  
<http://www.mdpi.com/1996-1073/3/12/1895/pdf>

Ghosh, Tilottama; Powell, Rebecca; Elvidge, Christopher; Baugh ,Kimberly; Sutton, Paul; Anderson, Sharolyn. (2010) **Shedding Light on the Global Distribution of Economic Activity** The Open Geography Journal 3 147-160

Ghosh, Tilottama., Powell, Rebecca.L., Anderson, Sharolyn. Sutton, Paul.C. Elvidge, Christopher.D., (2010), **Informal Economy And Remittance Estimates of India Using Nighttime Imagery**, International Journal of Ecological Economics & Statistics, 17

Sutton, Paul C.; Anderson, Sharolyn, J.; Elvidge, Christopher D.; Tuttle, Benjamin, T.; Ghosh, Tilottama (2009) **Paving the Planet: Impervious Surface as a Proxy Measure of the Human Ecological Footprint** Progress in Physical Geography 33(4) pp. 1-18

Sutton, Paul C.; Fildes, Stephen; Forster, Clive; Ghosh, Tilottama; Goetz, Andrew (2009) **Darkness on the Edge of Town: Mapping Urban and Peri-Urban Australia Using Nighttime Satellite Imagery** Professional Geographer 62(1) pp. 119-133

Ghosh, Tilottama; Anderson, Sharolyn; Powell, Rebecca L.; Sutton, Paul C.; Elvidge, Christopher D. (2009) **Estimation of Mexico's Informal Economy and Remittances Using Nighttime Imagery** Remote sensing 1, 418-444; doi:10.3390/rs1030418 (<http://www.mdpi.com/2072-4292/1/3/418/pdf>)

Elvidge, Christopher D.; Sutton, Paul, C.; Ghosh, Tilottama; Tuttle, Benjamin, T.; Baugh, Kimberly E.; Bhaduri, Budhendra; Bright, Edward (2009) **A global poverty map derived from satellite data** Computers and Geosciences 35 pp 1652-1660

Costanza, Robert; Perez-Maqueo, Octavio; Martinez, M. Luisa; Sutton, Paul C.; Anderson, Sharolyn J.; Mulder, Kenneth (2008) **The Value of Coastal Wetlands for Hurricane Protection** Ambio 37(4) June pp 241-248

Sutton, Paul C.; Ghosh, Tilottama; Elvidge, Christopher D. (2007) **Estimation of Gross Domestic Product at Sub-National Scales using Nighttime Satellite Imagery** International Journal of Ecological Economics & Statistics 8(S07) ISSN 0973-1385

Elvidge, Chris; Safran, Jeff; Tuttle, Benjamin; Sutton, Paul; Cinzano, Pierantonio; Pettit, Donald; Arvesen, John; Small, Christopher. (2007) **Potential for Global Mapping of Development Via A Nightsat Mission** GeoJournal 69(1-2) June pp 45-53 ISSN (1572-9893) online

Christopher D. Elvidge , Pierantoni Cinzano, , Donald R. Pettit, John Arvesen, Paul C. Sutton, Christopher Small, Ramakrishna Nemani, Travis Longcore . Catherine Rich, Jeffrey Safran, John Weeks, and Steve Ebener (2007) **NightSat: The Mission Concept** International Journal of Remote Sensing 28(12) ISSN 1366-5901 online

Martinez, M.L.; Intralawan, A.; Vasquez, G.; Perez-Maqueo, O.; Sutton, P.; Landgrave, R.; (2007) **The Coasts of our world: Ecological, Economic, and Social Importance.** Ecological Economics 63(2-3) pp 254-272

Christopher Elvidge; Benjamin Tuttle; Paul C. Sutton; Kimberly E. Baugh; Ara T. Howard; Christina Milesi; Budhendra Bhuduri, Ramakrishna Nemani (2007) ***Global Distribution and density of Constructed Impervious Surfaces*** Sensors 2007, 7, pp 1962-1979

Sutton, Paul C.; Cova, Tom; Elvidge, Chris; (2006) ***Mapping Exurbia in the conterminous United States using Nighttime Satellite Imagery*** June 20(2) Geocarto International

Tom Cova, Paul C. Sutton, Dave Theobald (2004) ***Exurban change detection in fire-prone areas with nighttime satellite imagery*** Photogrammetric Engineering and Remote Sensing 70(11) pp 1249-1257

Elvidge, Chris; Milesi, Christina; Dietz, John; Tuttle, Benjamin; Sutton, Paul; Nemani, Ramakrishna; Vogelmann, James; (2004) ***U.S. Constructed Area Approaches the Size of Ohio*** EOS 85(24) pp 233-234

Paul C. Sutton (2003) ***A scale-adjusted measure of "Urban Sprawl" using nighttime satellite imagery*** Remote Sensing of Environment 86 pp 353-369

Paul C. Sutton, Chris Elvidge, Tom Obremski (2003) ***Building and Evaluating Models to Estimate Ambient Population Density*** Photogrammetric Engineering and Remote Sensing 69(5) pp 545-553

Sutton, Paul; (2003) ***An Empirical Environmental Sustainability Index derived solely from Nighttime Satellite Imagery and Ecosystem Service Values*** 2003 Population and Environment 24(4)

Sutton, Paul; Costanza Robert; (2002) ***Global estimates of market and non-market values derived from nighttime satellite imagery, land use, and ecosystem service valuation*** Ecological Economics (41) pp 509-527

Keri M. Konarska, Paul C. Sutton, Michael J. Castellon (2002) ***Evaluating scale dependence of ecosystem service valuation: A comparison of NOAA-AVHRR and Landsat TM datasets*** Ecological Economics (41) pp 491-507

Sutton, P; Roberts, D; Elvidge, C; Baugh, K; (2001) ***Census from Heaven: An estimate of the global human population using nighttime satellite imagery*** International Journal of Remote Sensing Vol 22 (16) pp 3061-3076

Sutton, P; Montello, D; (2000) ***Public Opinion of Population Issues: A survey of Voters*** The Southwestern Geographer Vol 4 pp54-93

Elvidge, C.D.; Baugh, K.E.; Dietz, J.; Bland, T; Sutton, P.C.; Kroehl, H.W.; (1998) ***Radiance calibration of DMSP-OLS low-light imaging data of human settlements*** Remote Sensing of Environment May 6<sup>th</sup> 1998

Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, S. Naeem, K. Limburg, J. Paruelo, R.V. O'Neill, R. Raskin, P. Sutton, and M. van den Belt. (1998). ***Auditing the earth: Costanza and his coauthors reply.*** Environment 40:26-27.

Sutton, P; (1997) ***Modeling Population Density using Nighttime Satellite Imagery and GIS*** Computers, Environment and Urban Systems 21(3/4) pp 227-244

Sutton, P; Roberts, D; Elvidge, C; and Meij, H; (1997) ***A comparison of Nighttime Satellite Imagery and Population Density for the Continental United States*** Photogrammetric Engineering and Remote Sensing 63 (11) pp 1303-1313

Costanza, R; d'Arge, R; de Groot, R; Farber, S; Grasso, M; Hannon, B; Naeem, S; Limburg, K; Paruelo, J; O'Neill, R; Raskin, R; Sutton, P; van den Belt, M; (1997) ***The Value of the World's Ecosystem Services and Natural Capital*** Nature Vol 387 May 15

**The value of the world's ecosystem services and natural capital** (Reprinted from Nature, vol 387, pg 253, 1997) Costanza R, d'Arge R, de Groot R, Farber S, Grasso M, Hannon B, Limburg K, Naeem S, O'Neill RV, Paruelo J, Raskin RG, Sutton P, van den Belt M Source: Ecological Economics 25 (1): 3-15 APR 1998

Robert Costanza; Ralph d'Arge; Rudolf de Groot; Stephen Farber; Monica Grasso; Bruce Hannon; Karin Limburg; Shahid Naeem; Robert V. O'Neill; Jose Paruelo; Robert G. Raskin; Paul Sutton; Marjan van den Belt (1997) ***The Value of Ecosystem Services: Putting the Issues into Perspective*** Ecological Economics 25:67-72

Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, S. Naeem, K. Limburg, J. Paruelo, R.V. O'Neill, R. Raskin, P. Sutton, and M. van den Belt. (1997). ***Valuing ecosystem services: a response.*** Regulation 20:2-3

Proctor, J; Sutton, P, and Michaels, G (1995) ***Multimedia Guided Writing Modules for Introductory Human Geography*** Journal of Geography Volume 94, No. 6 pp 571-577

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#### BOOKS AND BOOK CHAPTERS

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Sutton, Paul; Elvidge, Christopher (2015) "*Night Lights – An indicator of the good life?*", in *The Bright Side of Night – Urban Lighting, Light Pollution and Society* Routledge Press Ed. Josiane Meier

Sutton, Paul (2014) "*Space Matters: Exploring problematic spatial issues in the valuation of ecosystem services*" in *Valuing Ecosystem Services-Methods and Applications* Edward Elgar Press Ed. Karachepone Ninan (<https://www.elgaronline.com/view/9781781955154.xml>)

Montello, D.; Sutton, P.C.; *An Introduction to Scientific Research Methods in Geography* (2012) (2<sup>nd</sup> Edition) Sage Publications Ltd. London ISBN 1-4129-0286-X

Elvidge, C.D., Baugh, K.E., Sutton, P.C., Bhaduri, B., Tuttle, B.T., Ghosh, T., Ziskin, D., Erwin, E.H., 2010, "[Who's In The Dark: Satellite Based Estimates Of Electrification Rates](#)", *Urban Remote Sensing: Monitoring, Synthesis and Modeling in the Urban Environment*, Ed. Xiaojun Yang, Wiley-Blackwell, Chichester, UK

Sutton, P.C., M.J. Taylor, C.D. Elvidge, 2010, "*Using DMSP OLS Imagery to Characterize Urban Populations in Developed and Developing Countries*", *Remote Sensing of Urban and Suburban Areas*, Ed. Rashed, Tarek; Jürgens, Carsten, Springer, 329-348 Kluwer Academic Press ISBN-10 1402043716

Elvidge, C.D., Sutton, P.C., Tuttle, B.T., Ghosh, T., Baugh, K.E, 2009, "[Global Urban Mapping Based on Nighttime Lights](#)", *Global Mapping of Human Settlement*, Chapter 6, 129 - 144

Montello, D.; Sutton, P.C.; *An Introduction to Scientific Research Methods in Geography* (2006) Sage Publications Ltd. London ISBN 1-4129-0286-X

Sutton, Paul C.; Taylor, Matthew J.; Anderson, Sharolyn J.; and Elvidge Chris (2007) *Ch 14: Sociodemographic Characterization of Urban Areas Using Nighttime Imagery, Google Earth, Landsat, and "Social" Ground Truthing* in *Urban Remote Sensing* edited by Qihao Weng and Dale A. Quattrochi CRC Press of Taylor and Francis Group ISBN 0-8493-9199-7



Elvidge, C.D., Sutton, P.C., Wagner, T.W., Ryznar, R., Goetz, S.J., Smith, A.J., Jantz, C., Seto, K., Imhoff, M.L., Vogelmann, J., Wang, Y.Q., Milesi, C., and Nemani, R., 2004, Urbanization. Land Change Science Kluwer Academic Publishers ISBN 1-4020-2561-0

Paul C. Sutton (2003) *Estimation of Human Population Parameters Using Nighttime Satellite Imagery* (Book Chapter in Remotely Sensed Cities) Victor Mesev Editor Taylor & Francis ISBN 0 415 26045 0

Ray, John, Sutton, Paul C.; Bingham, Andrew (2003) *Mapping Air Quality Values for the NPS Inventory and Monitoring Program* ESRI Press <http://www.nps.gov/gis/mapbook/45.html>

Roberts, D; Sutton, P; Funk, C; Algona, P; Waller, E; Sundbeck, C; (2000) *Physical Geography: A laboratory manual* Kendall/Hunt Publishing Co (ISBN 0-7872-6484-9)

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### PUBLISHED CONFERENCE PROCEEDINGS

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Ghosh, T; Elvidge, C; Sutton, PC; Baugh, K; Zhizhin, M; Hsu, FC (2018) *Preliminary Analysis towards creating a disaggregated GDP map of the world using the annual SNPP-VIIRS nighttime imagery from 2015* Population Association of American Conference in Denver, CO April 2018

Sutton, P; Anderson, S; Elvidge, C (2012) *Using Nighttime Satellite Imagery as a proxy measure of Human Well Being* Australia-New Zealand Ecological Economics Conference "Green Growth or De-Growth" Bond University, Gold Coast, Australia November 2012

Anderson, S; Sutton, P (2012) *Mapping and Monetizing the Human Ecological Footprint: Exploring national patterns of ecological deficit and surplus* Australia-New Zealand Ecological Economics Conference "Green Growth or De-Growth" Bond University, Gold Coast, Australia November 2012

Sutton, P.; Anderson, S; Baugh, K; Ziskin, D; Ghosh, T; Ghosh, T.; Elvidge, C.; (2011) *Satellite Mapping of Constructed Surfaces in China for the Year 2010* Asia Pacific Action Network <http://www.apan.net/meetings/HongKong2011/Session/DMSP.php>

Liu, Q; Sutton, P; Elvidge, C (2010) *Relationships between Nighttime Imagery and Population Density for Hong Kong* Asia Pacific Action Network <http://www.apan.net/meetings/HongKong2011/Session/DMSP.php>

Sutton, P.; Ghosh, T.; Elvidge, C.; Baugh, K.; Ziskin, D.; (2010) *A 2010 Mapping of the Constructed Surface Area Density for Southeast Asia – Preliminary Results* Asia Pacific Action Network (APAN) <http://www.apan.net/meetings/Hanoi2010/Session/DMSP.php>

Ghosh, T.; Sutton, P.; Elvidge, C.; (2010) *Estimating the Information and Communication Technology Development Index (IDI) using nighttime satellite imagery* Asia Pacific Action Network (APAN) <http://www.apan.net/meetings/Hanoi2010/Session/DMSP.php>

Elvidge, C.D., B.T. Tuttle, P.C. Sutton, 2009, *Collaborative Tool for Collecting Reference Data on the Density of Constructed Surfaces Worldwide*, Sixth International Symposium on Digital Earth: Models, Algorithms, and Virtual Reality, SPIE, Proc. of SPIE Vol. 7840 7

Elvidge, C.D.; Erwin, E.H.; Baugh, K.E.; Ziskin, D.; Tuttle, B.T.; Ghosh, T.; Sutton, P.C., 2009, "[Overview of DMSP nighttime lights and future possibilities](#)", *IEEE Proceedings of the 7th International Urban Remote Sensing Conference*, 5 Pages

Ghosh, T.; Sutton, P.; Powell, R.; Anderson, S.; Elvidge, C.D., 2009, "[Estimation of Mexico's informal economy using DMSP nighttime lights data](#)", *IEEE Proceedings of the 7th International Urban Remote Sensing Conference*, 10 Pages

Elvidge, C.D., Baugh, Kimberly E., Howard, Ara T., Sutton, P.C., Tuttle, Benjamin T., Erwin, Edward H., (2007) *Change detection in satellite observed nighttime lights: 1992-2003* 2007 Urban Remote Sensing Joint Event, URS, art. no. 4234469

Elvidge, C.D., Pettit, D.R., Cinzano, P., Sutton, P.C., Small, C. (2007) *Overview of the Nightsat Mission Concept* (2007) Urban Remote Sensing Joint Event, URS, art. no. 4234450

Elvidge, C.D., Baugh, Kimberly E., Howard, Ara T., Sutton, P.C., Tuttle, Benjamin T., Erwin, Edward H., (2007) *Can Poverty rates be estimated using satellite data?* 2007 Urban Remote Sensing Joint Event, URS, art. no. 4234360

Anderson, S; Taylor, M.J.; Sutton, P.C.; Steinberg, M.K. (2005) *Assessment of Urban Land Use Cover Change in Ciudad Victoria, Tamaulipas, Mexico*. Proceedings of the 5<sup>th</sup> International Symposium, Remote Sensing of Urban Areas. The International Archives of the Photogrammetry, Remote Sensing, and Spatial Information Sciences, Vol XXXVI – 8/W27. ISSN 1682-1777.

Elvidge, C.D., Imhoff, M.L., Sutton, P.C. (2000) Relation between fossil fuel trace gas emissions and satellite observations of nocturnal lighting IAPRS Vol XXXIII Amsterdam

Sutton P; (2000) *Progress in Empirical Measurement of the Urban Environment: An exploration of the theoretical and empirical advantages of using Nighttime Satellite Imagery in Urban Studies* GIS and Environmental Modelling Conference #4 Banff, Canada September 2000

Collins EF, Roberts DA, Sutton PC, Funk CC, Borel CC (1999) *Temperature estimation and compositional mapping using spectral mixture analysis of thermal imaging spectrometry data* Imaging Spectrometry V Editors: Descour MR, Shen SS Proceedings Of the Society Of Photo-Optical Instrumentation Engineers (SPIE), 3753 pp 286-299

Sutton, P, Roberts, D; Leskow, J; Elvidge, C; (1997) *A Preliminary Investigation of the Utility of Low-Gain DMSP OLS Nighttime Satellite Imagery for Modeling Population Density* University Consortium for Geographic Information Science conference, Bar Harbor Maine June, 1997 with paper on the web at:

<http://www.spatial.maine.edu/ucgis/testproc/sutton/sutton.html>

Sutton, P; (1999) *The use of regionalized parameters for estimating the population of nations using remote sensing* at the Western Regional Science Association meeting in Ojai, California February 1999

Sutton, P; (1997) *"Light Up Your Nation: An ArcView based education module exploring Nighttime Satellite Imagery and GIS"* In proceedings of ACSM/ASPRS conference, Seattle, Washington April, 1997

Sutton, P; (1997) *A "Comparison of the low-gain and high-gain DMSP Nighttime Satellite Imagery products for use in modeling population density over the Continental United States"* In proceedings of ACSM-ASPRS Annual Conference, Seattle, Washington April, 1997

## OTHER PUBLICATIONS

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Martin, P., Ward, J. D., & Sutton, P. (2017). *Why a population of, say, 15 million makes sense for Australia*. <https://www.theguardian.com/business/2017/jul/11/why-a-population-of-say-15-million-makes-sense-for-australia>

Ward, J., Chiveralls, K., Fioramonti, L., Sutton, P., & Costanza, R. (2017). *The decoupling delusion: rethinking growth and sustainability*. <http://theconversation.com/the-decoupling-delusion-rethinking-growth-and-sustainability-71996>

Rafa, M; Moyer, J; Wang, Z; Sutton, PC (2017) Estimating District GDP in Uganda – a brief produced by USAID and the Pardee Center for International Futures

Elvidge, Christopher D.; Sutton, Paul C.; Anderson, Sharolyn; Baugh, Kimberly E.; Ziskin, Daniel. (2012) *Satellite Observation of Urban Metabolism* earthzine: fostering earth observation and global awareness (<http://www.earthzine.org/2011/09/26/satellite-observation-of-urban-metabolism/> )

Sutton Paul C., (2012) *The Real Wealth of Nations: Mapping and Monetizing Biocapacity and the Human Ecological Footprint* Prairie Fire: The progressive voice of the plains  
<http://www.prairiefirenewspaper.com/2012/02/the-real-wealth-of-nations>

Sutton, Paul C., (2008) Book Sections for The Encyclopedia of Global Warming (Salem Press)  
Megacities (1,200 words), Population Growth (1,200 words), Damages : Market & Non-Market (900 words), Limits to Growth (900 words)

Sutton, Paul C., (2008) Book Section for The Encyclopedia of Geography (a SAGE reference publication) on 'Environmental Services' (1,000 words)

Elvidge, C.D., Milesi, C., Dietz, J.B., Tuttle, B.T., Sutton, P.C., Nemani, R. Vogelman, J.E. (2004) *Paving Paradise* GeoSpatial Solutions 14 (9) pp. 58

Sutton, Paul; Lopez, Mario (2003) *Ironing Out Colorado* GeoWorld March pp 58

Sutton, Paul (2002) *The Lights Come out at Night* GeoWorld September pp 30-33

Ray, John; Sutton, Paul (2002) The National Park Service Air Atlas (an ArcIMS site for dissemination of spatially interpolated air quality parameters)

Sutton, P. (2001) Introduction to *Overpopulation* by John Zeaman. (A Franklin Watts series of short books for young adults) Grolier Publishing

Sutton, P: (2000) *Population Growth and Distribution*, Encyclopedia of World Geography Salem Press

Sutton, P, (1998) *Unit #11 Registration and Conflation of the NCGIA's Core Curriculum Technical Program* (URL: <http://www.ncgia.ucsb.edu/education/curricula/cctp> )

Sutton, P; Bianco, D; Gray, V.; (1997) *Lab Manual for Geog 176-B: Introducing the technical issues of GIS using Arc/INFO* (Technical Report 98-1), Santa Barbara, California; National Center for Geographic Information and Analysis

Sutton, P; Van Zuyle, P; and Palladino, S; (1995) *"Color Your World: An Introduction to ArcView Education Modules"*, Technical Report 95-5, Santa Barbara, California; National Center for Geographic Information and Analysis (NCGIA)

## CONFERENCE PRESENTATIONS

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Sutton, Paul (2018) *Using Geo-spatial data to develop 'Apples to Apples to Apples' metrics of urban sustainability*. 38<sup>th</sup> Annual EARSeL Symposium Chania, Greece July 11

Tilottama Ghosh, Paul C. Sutton, Christopher D. Elvidge, Kimberly Baugh, Mikhail Zhizhin, Feng Chi Hsu (2018) *Preliminary Analysis towards creating a disaggregated Gross Domestic Product map of the world using the annual SNPP-VIIRS nighttime imagery from 2015* Annual Conference of the Population Association of America, Denver, CO May 14

Sutton, Paul (2018) *Using nighttime imagery to estimate Gross Domestic Product at subnational levels in Africa* Annual conference of the Association of American Geographers New Orleans, LA April

Sutton, Paul (2012) *The Spatial GINI Coefficient* Population Association of America, San Francisco May 2012

Paul C. Sutton; Robert Costanza; Joe Roman; Ida Kubiszewski (2011) *Urbanization, Climate Change, and Changes to Ecosystem Services in Coastal Areas*, Abstract GC32C-02 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

Sharolyn Anderson, Chris Elvidge, Paul Charles Sutton. (2011), *Spatial resolution and detection limit considerations for low light imaging of urban land use patterns*, Abstract GC33B-1081 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

Ghosh, T; Elvidge, C; Sutton, P; Baugh, K; Tuttle, B; Ziskin, D (2011) *Using Nighttime Satellite Imagery to Create a Global Grid of Distributed Fossil Fuel CO2 Emissions* at The World Geospatial Forum Hyderabad, India

Sutton, Paul C. (2010) *Using Impervious Surface as a spatially explicit proxy measure of CO2 emissions* At the Annual Conference of the Association of American Geographers, Washington DC

Sutton, Paul C.; Anderson, Sharolyn J.; Tuttle, Benjamin (2010) *The Real Wealth of Nations: Mapping and Monetizing the Human Ecological Footprint* at The Footprint Forum in Siena Italy

Sutton, Paul C. (2009) *Impervious surface as a spatial proxy measure of CO2 emissions* at the 3rd EARSeL Workshop Land Use and Land Cover in Bonn Germany November 2009

Elvidge, Chris; Tuttle, Ben; Sutton, Paul (2009) *Collaborative Tool for Collecting Reference Data on the Density of Constructed Surfaces* Worldwide International Symposium of the Digital Earth (ISDE6) Beijing, China

Ghosh, Tilottama, Sutton, Paul (2009) *Estimation of Mexico's Informal Economy Using DMSP Nighttime Lights* Conference of Latin Americanist Geographers (CLAG) Managua, Nicaragua January 2009

Tuttle, Benjamin; Sutton, Paul; Anderson, Sharolyn; Elvidge, Chris (2009) *Developing a Web-Based Collaborative Mapping Tool to Map Impervious Surface Globally* the annual Association of American Geographers, Las Vegas Nevada



Sutton, Paul (2008) *Mapping the Dollar Value of Natural Production and dollar cost of human Consumption Globally* At the Annual Conference of the Association of American Geographers, Boston MA

Ghosh, Tilottama; Sutton, Paul (2008) *Estimating the GDP of developing nations using nighttime satellite imagery* At the Annual Conference of the Association of American Geographers, Boston MA

Sutton, Paul (2007) *Coastal Wetlands and Storm Protection: A spatially explicit estimate of ecosystem service value* at the annual Association of American Geographers Conference, San Francisco, California March 2007

Tuttle, B; Elvidge, C; Baugh, K; Nemani, R; Milesi, C; Sutton, P (2007) *Global Mapping of Impervious Surface Area* at the annual Association of American Geographers Conference, San Francisco, California March 2007

Elvidge, Christopher D; Pettit, Donald R.; Cinzano Pierantonio; Sutton, Paul C.; Small, Christopher (2007) *Overview of the Nightsat Mission Concept* at the 2007 Urban Remote Sensing Joint Event, Paris, France April 2007

Sutton, P (2006) *Mapping urban and exurban sprawl in Australia using nighttime satellite imagery* at the bi-annual Australian Population Associate Conference in Adelaide, South Australia December 2006

Ghosh, Tilottama, Sutton, Paul C.; Elvidge, Christopher D. (2006) *An Overview of the Use and the Potential of Nighttime Imagery for Estimation of Socio-economic Variables* at the Annual Association of American Geographers Conference, Chicago, Illinois March 2006

Tuttle, Benjamin T.; Elvidge, Christopher D.; Saffran, Jeff; Baugh, Kim; Nemani, Ramakrishna; Melisi, Christina; Sutton Paul D (2006) *Spatial Mapping of Impervious Surfaces Associated with Urban Development* at the Annual Association of American Geographers Conference, Chicago, Illinois March 2006

Saffran, Jeff; Elvidge, Christopher D.; Sutton, Paul C.; Tuttle, Benjamin T. (2006) *Potential for Global Mapping of Development via a NightSat Mission* at the Annual Association of American Geographers Conference, Chicago, Illinois March 2006

Sutton, Paul C.; Richards, Noel; Fildes, Stephen (2006) *Mapping the Bush-Wildlands interface in Australia* (2006) at the International Geographical Union conference in Brisbane, Queensland July

Sutton, Paul C (2006) *Urban and Exurban Sprawl in Australia* at Spatial Information Day (SID 2006) conference in the Adelaide Town Hall Adelaide, South Australia August 2006

Sutton, Paul C; (2005) *Mapping Estimation of GDP at sub-national scales using nighttime satellite imagery* at the Annual Association of American Geographers Conference, Denver, Colorado March 2005

Sutton, Paul C; (2004) *Mapping "Exurbia" in the conterminous U.S. using Nighttime Satellite Imagery* at the Annual Association of American Geographers Conference, Philadelphia, Pennsylvania March 2004

Cova, Tom, Sutton, Paul C, Theobald, Dave; (2004) *Light my fire proneness: residential change detection in the urban-wildland interface with nighttime satellite imagery* at the Annual Association of American Geographers Conference, Philadelphia, Pennsylvania March 2004

Sutton, Paul C; (2004) *An exploration of nighttime satellite imagery from the DMSP OLS for use in mapping population and wealth in Guatemala* at the Congress of Latin Americanist Geographers, Antigua, Guatemala May 2004

Noonan, Jessica; Keables, Michael, Sutton, Paul (2004) *An Urban Land-use Study of Population Growth and Urban Sprawl in the Denver-metro area using MSS and Landsat TM imagery* at the ASPRS annual conference in Denver, Colorado May 2004

Elvidge, Chris; Dietz, John; Sutton, Paul (2003) *Impervious Surface Area of the Conterminous United States* at the Coastal Global Terrestrial Observing System (GTOS) meeting in Costa Rica

Sutton, Paul (2003) *Perspectives from Academia regarding NESDIS data and service* NESDIS Data User's Workshop, NIST Auditorium, NOAA Boulder, CO

Sutton, Paul (2003) *A scale-Adjusted measure of Urban Sprawl using Nighttime Satellite Imagery* at the Annual Association of American Geographers Conference, New Orleans, Louisiana March 2003

Sutton, Paul (2002) *An empirical Environmental Sustainability Index derived solely from Nighttime Satellite Imagery and Ecosystem Service Values* at the Annual Association of American Geographers Conference, Los Angeles, California March 2002

Sutton, Paul (2001) *"Do Americans Really Believe in the 'Black Helicopters'? Reflections of a Census 2000 enumerator in the Colorado Front Range"* at the Annual Association of American Geographers Conference, New York, New York March 2001

Sutton, P; (2000) *Census from Heaven: An estimate of the global human population using nighttime satellite imagery* at the Annual Association of American Geographers Conference, Pittsburgh Pennsylvania March 2000

Sutton, P; Roberts, D; (1999) *Unmixing the mixed pixel with Hyperspectral Data and Spectral Libraries* at the Annual Association of American Geographers Conference, Honolulu Hawaii, March 1999

Sutton, P (1998) *Is the nighttime the right time for city population estimation?* Association of American Geographers Annual Conference, Boston, Massachusetts March 1998

Sutton, P (1998) *Three potholes on the road to my dissertation: 1) What is Population Density? 2) What light threshold best captures city points? And 3) How do I use aggregate national*

*figures to model the city area-city population relationship?* At the 2nd Annual Western Geography Graduate Student Conference in San Diego, California February, 1998

Sutton, P. (1997) *The Role of Population in Sustainable Economic Activities* at The 6th Annual Conference of the Greening of Industry Network, Chair of Doctoral Breakout Session titled: Green Economic and Analytic Models, Santa Barbara, California November, 1997

Sutton, P; (1997) *"A Method for Modeling Population Density using Nighttime Satellite Imagery and GIS"*, Association of American Geographers Annual Conference, Dallas/Ft.Worth, Texas April 1997

Sutton, P; Van Zuyle, P (1996) *"Using ArcView-Based Learning Modules in the Classroom"* In the Program for the 81st Annual Meeting of the National Council for Geographic Education, Santa Barbara, California November 1996

Sutton, P; Palladino, S; Van Zuyle, P (1995) *"Color Your World: A K-12 GIS education module using ArcView 2"*, Association of American Geographers Annual Conference, Chicago, Illinois May 1995

## INVITED PRESENTATIONS

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*Do the limits to growth apply to smart cities that have achieved the sustainable development goals?*  
7th International Workshop Advances in Cleaner Production Baranquilla, Colombia June 21, 2018

*Behavioral Economics and the Prospects of a New Economic System Based on Wellbeing* Symposium  
sponsored by the Ethics and Ecological Economics Forum at the Iliff School of Theology April 23, 2018

*Valuing Nature: Ecosystem Services and why they count* Speaker for the 'Engaging Ideas' series sponsored  
by the University of Denver January, 2018 <https://www.du.edu/ideas/interview-videos/valuing-nature.html>

*Changes to the Global Value of Ecosystem Services: A Market Failure?* Yi-Fu Tuan Lecture at the  
Department of Geography University of Wisconsin, Madison November 10th, 2017

*Changes to the Value of Ecosystem Services: Scenarios for Mexico 2010-2015* Keynote Speech and  
workshop at the Department of Economics at the University of Guadalajara, November 22nd, 2017

*Developing an atlas of Ecosystem Service Values for Latin American Countries* Keynote Speech and  
workshop at Universidade Paulista in Sao Paulo, Brazil October 23, 2017

[https://www.unip.br/presencial/comunicacao/exibe\\_noticia.asp?id=136927](https://www.unip.br/presencial/comunicacao/exibe_noticia.asp?id=136927)

*Foundations of Urbanization Science: Mapping and Measuring Global Urban Metabolism* At the meeting of  
the Human Planet Initiative, University of Twente, Enschede, Netherlands Sept 13<sup>th</sup>, 2017

*Changes to the Global Value of Ecosystem Services: A Market Failure?* Keynote Speech Geography Teachers  
Association of South Australia Annual Conference, Adelaide South Australia May 26, 2016

*Changes to the Global Value of Ecosystem Services: A Market Failure?* University of Colorado at Boulder  
Geography Department Colloquium Series February 2<sup>nd</sup>, 2016

*The Ecological Economics of Land Degradation* Spatial Information Day sponsored by the Surveying and  
Spatial Sciences Institute of South Australia Adelaide Convention Center August 15<sup>th</sup> 2015

*Alone in the Void: Getting real about the fragile and tenuous nature of modern civilization* Public Lecture  
for the Barbara Hardy Institute at the University of South Australia, Adelaide December, 2013

*The Dark Side of The Earth: Some alternative future observations of the earth from space at night*  
Keynote Speech at Smart City Expo World Congress in Barcelona, Spain, November 2012

*The Spatial GINI Coefficient* Population Association of America, San Francisco May 2012

*The Earth from Space at Night: Explorations of the Human Environment Sustainability Problematic using  
Nighttime Satellite Imagery* University of Nebraska – Lincoln November 2011

*The Real Wealth of Nations: Mapping and Monetizing the Human Ecological Footprint* University of  
Nebraska – Lincoln November 2011

*The Real Wealth of Nations: Mapping and Monetizing the Human Ecological Footprint* at Benares Hindu  
University (BHU) in Varanasi, India December 19<sup>th</sup>, 2010

*Paving the Planet: Impervious Surface as a proxy measure of the Human Ecological Footprint* at  
Presidency College in Calcutta, India December 15<sup>th</sup>, 2010

*The Earth at Night from Space: How nighttime satellite imagery informs our understanding of  
sustainability* at Loreto College in Calcutta, India December 14<sup>th</sup>, 2010

*Coastal Wetlands and Storm Protection: A spatially explicit estimate of ecosystem service value (2010)*  
Invited by the Dept of Transportation to the 89th Annual Transportation Research Board Conference  
Washington DC June 10, 2010

*Social Science Applications for Nocturnal Imagery of the Earth* at the Population-Environment Research Network Cyber-seminar sponsored by CIESIN at the Earth Institute at Columbia University addressing the question: *What are the Remote Sensing Data Needs of the Population-Environment Research Community?* (Spring 2010)

*The Earth from Space at Night: Explorations of the Human-Environment-Sustainability Problematic using Nighttime Satellite Imagery* invited presentation at the United States Air Force Academy in Colorado Springs (November 2009)

*Global Population Trends: implications and consequences* at the Centennial Chamber of Commerce Panel Discussion on emerging trends in Green Industries in Colorado. The panel consisted of Hunter Lovins (Natural Capitalism Solutions), Paul Sutton (University of Denver), Mary Fischer (Excel Energy) (August 2010)

*The value of coastal wetlands for hurricane protection* (2008) Spatially Explicit Valuation of Ecosystem Services Workshop of the Environmental Protection Agency Marriot Hotel Denver, CO January 2008

*Urban and Exurban Sprawl in Australia* Spatial Information Day 2006 (SID 2006) Thursday 10 August 2006 at the Adelaide Town Hall, King William Street, Adelaide

*Some applications utilizing Nighttime Satellite imagery provided by the DMSP OLS;* (2006) 1<sup>st</sup> Semester Colloquium series; Department of Geography, Population, and Environmental Management, Flinders University Adelaide, Australia

*Mapping the Urban-Bush interface in Australia using Nighttime Satellite imagery;* (2006) 2<sup>nd</sup> Semester Colloquium series; Department of Geography, Population, and Environmental Management, Flinders University Adelaide, Australia

*Using geographic tools like GIS, Remote Sensing, and Google Earth to understand the urban environments of the world;* (2006) Westminster College, Adelaide, Australia

*Characterizing urban and exurban sprawl in Australia using Nighttime Satellite Imagery;* (2006) SPAR Branch at Planning SA at 11.00am. Level 4, Roma Mitchell House, 136 North Tce, South Australia Planning Association

*The long and winding streams and memes of e-mail: collaborative research in ecosystem service valuation;* (2006) 2<sup>nd</sup> Semester Colloquium series; Department of Geography, Population, and Environmental Management, Flinders University Adelaide, Australia

*Development of Simple Environmental Sustainability Metrics;* (2006) Guest Lecture in Environmental and Economy, Department of Geography, Population, and Environmental Management, Flinders University Adelaide, Australia

*The Nighttime is the Right Time: Making Observations of Human Activity from Nighttime Imagery;* Concepts in GIS Speaker Series Warner College of Natural Resources, Colorado State University

*The nighttime is the right time to make satellite observations of human activity* Presentation to the University Chapter of Sigma Xi

Panel Discussant at the Workshop on Systematic Population Estimation for Humanitarian Purposes sponsored by the State Department and the Census Bureau at the System Planning Corporation in Arlington Virginia May 2004

*Using the NLCD land cover and Nighttime Satellite imagery to map Exurban Growth in the Western United States* at Stanford's Center for the Study of the North American West workshop: "On the Edge: Metropolitan Growth and Western Environments" Palo Alto, California May 2004

*Uses of DMSP OLS imagery for mapping socio-economic phenomena* Remote Sensing Course at the University of Colorado at Boulder, Boulder CO April 2002



*Practical Applications of GIS and Satellite Imagery* University of Guadalajara, Guadalajara Mexico  
December 2001

*Some applications and problems associated with making spatially explicit measurements of ecosystem service value* Ecosystem Service Valuation Workshop University of Maryland, Baltimore MD November 2001

*Potential synergy between Shuttle Radar Topography Mission (SRTM) data and DMSP OLS nighttime satellite imagery for producing semi-independent estimates of urban populations for all urban agglomerations of the globe* Workshop on Global Infrastructure Mapping November 2000 Sponsored by Jet Propulsion Laboratories and CIESIN

*An overview of methods for estimating urban populations using nighttime imagery*, Workshop on Gridding global population data at Columbia University, May 2-3 2000 Sponsored by the National Center for Geographic Information and Analysis, CIESIN, and World Resources International

*Census from Heaven: An estimate of the global human population using nighttime satellite imagery and GIS* 1) Centro de investigaciones en Matematicas in Guanajuato, Mexico November 17<sup>th</sup>, 1998 2) Dept of Geography, University of Utah Salt Lake City Utah March 1999

*Challenges faced when using Remote Sensing Data and Geographic Information Systems for Socioeconomic Studies* at the Social Sciences and Satellites workshop sponsored by the Consortium for International Earth Science Information Network (CIESIN) held at the World Bank in Washington D.C. September, 1997

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## TEACHING

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### Courses Taught

#### University of Denver

FSEM 1111 Utopia, Dystopia, and the End of the World	Geog 3890 Ecological Economics
Geog 4020 Research Methods	Geog 2050 Geographic Statistics
Socs 1103 Global Issues and Society	Socs 1103 Intro to Human Geography
Geog 3530 GIS Applications for Natural Resources	Geog 2250 Intro to GIS
Geog 3320 Human Dimensions of Global Change	Geog 3650 Geographic Information Analysis
Geog 2410 Population Geography	Geog 3200 Intro to Remote Sensing

#### University of California at Santa Barbara

Geog 115-A Introduction to Remote Sensing and Aerial Photo Interpretation  
Geog 5 Introduction to Human Geography

#### University of South Australia (School of Natural and Built Environments)

GEOE 2022 Environmental Remote Sensing

#### The Anacapa School (private high school in Santa Barbara, California)

Physics      Chemistry      Math

### Course Evaluations

I have posted end of course anonymous student evaluation documents here:

[http://urizen-geography.nsm.du.edu/~psutton/AAA\\_Sutton\\_WebPage/Sutton/Promotion\\_Materials/Promotion\\_Materials\\_Sutton.htm](http://urizen-geography.nsm.du.edu/~psutton/AAA_Sutton_WebPage/Sutton/Promotion_Materials/Promotion_Materials_Sutton.htm)

Note: My course evaluations are significantly above university averages and I have served as primary advisor to more graduate students than any other faculty member in my department. Graduate students typically choose their advisor in our department.

## Selected Student Dissertations and Theses

Joseph Hoover (PhD – 2014) Investigating the utility of web-based GIS in water quality environmental decision-making

Amir Siraj (PhD – 2014) Climatic impacts on the spread of malaria in Ethiopia

Kristina Yamamoto (PhD): Identifying similar biophysical characteristics among nesting beaches of green turtles of Turkey using remote sensing techniques.

Tilottama Ghosh (PhD): Shedding light on the spatial distribution of economic activity using nighttime satellite imagery

Lisa Piscopo (PhD): Explanation of High Stakes Testing in Colorado Public Schools

Bill Jeffrey (MSGIS): Does Urban Sprawl Correlate with Commuting Time?

Marianne Koshak (MSGIS): Using GIS to Identify Areas in Colorado Underserved by the Vaccine for Children

John Van Auken (MSGIS): Evaluation of Spatial Analytic techniques to predict the next crime in crime series

Heather Knight (MSGIS): GIS Web Application for Air Quality Monitoring in the National Parks

Keri Konarska (MSGIS): Evaluation of the Scale Dependence of Ecosystem Service Valuation; A Comparison of NOAA-AVHRR, and Landsat TM Data Sets

Brenden McNeil (MSGIS): Implementation of a 3-D GIS Application at Timpanogos Cave NM, Utah

Andrew Kuster (MSGIS): Using GIS to Develop a Non-Ticket Shoreline Parcel Acquisition Plan for Public Access Preservation

Jason Thoene (MSGIS): Implementation of a GIS for Regional Management of Leafy Spurge (*Euphorbia Eusula*) and Yellow Starthistle (*Centaurea Solstitialis*) in the Western US

Frank Orr (MSGIS): The New Pueblo Freeway: A project website using ArcIMS

Jessica Noonan (MSGIS): Growth in Denver: Assessing the Roles of Population and Land Use Decisions in the Denver Metro Area using Landsat imagery and US Census Data

Susan Parks (MSGIS): Spatial Pattern Analysis of Landsat ETM Satellite Imagery to Determine Logging Extent and Intensity in the Eastern Amazon

Chris Grubb (MSGIS): A prototype of the Kansas City Regional Crime Analysis GIS

Alex Muleh (MSGIS): Development of Custom Microsoft .NET and ESRI Arc Objects based line of Sight tools for location suitability, Launch planning and Telemetry Tower Placement

## SERVICE

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### **University Service**

Academic Senate (Elected at large representative 2011–2016)  
-Personnel Committee  
-Post Tenure Review Committee  
Faculty Representative to the Conduct Review Board (2009 – 2015)  
Administrator Evaluation Development Committee (2008)  
Faculty Forum Editor (2008-2009)  
Tuition Exchange Task Force (2007)  
Academic Senate (Geography Department Representative 2007, 2008, 2009)  
-Executive Council  
-Finance Committee  
-Graduate Council  
-Sustainability Council  
UDCC Mentoring (2000, 2001)  
Dialogs and Destinations Instructor (2003, 2004, 2007, 2008, 2009, 2010, 2011)  
First Year Seminar Information Exchange Meetings  
Internationalization (Mexico, Nicaragua, Guatemala, Germany, Australia, Italy)

### **Divisional Service**

NSM Promotion and Tenure Committee (2007-2008)  
NSM Representative at Undergraduate Council (2004-2005)  
Collaborative proposals with other DU Faculty  
Graduate Student Posters at NSM Poster Sessions

### **Departmental Service**

Director of Graduate Studies in Geography (2007 – 2012)  
Director of the MS GIS program (2000 – 2005, 2013 - Present)  
Graduate Admissions Committee  
Graduate Standards Committee  
MS GIS Committee  
Departmental IT Committee  
Steering Committee work for Undergraduate and Graduate Curriculum Planning

### **Community Service**

Member of the Board of Directors Denver Regional Council of Governments (DRCOG)  
Elected to the Board of Trustees for the Town of Morrison, Colorado  
Member of the Planning Commission for the Town of Morrison, Colorado  
Basketball coach for 5<sup>th</sup> & 6<sup>th</sup> Grade boys YMCA basketball league (“The Flying Spaghetti Monsters”)  
Faculty Advisor/Sponsor DUTT (Table Tennis Club)  
Volunteer for Project Pride (Outdoor Environmental Education) at Red Rocks Elementary School  
Judge and “Alex Trebeq guy” at National Geographic’s Geography Bee (2004 & 2005 & 2010)  
Guest lectures at CU Boulder, Kendallvue Elementary, Red Rocks Elementary, and Rick’s Center  
Election Judge for Jefferson County (2004)  
Census Enumerator (Census 2000)

## Academy Service

Program review for Department of Geography at California State University Northridge

Chair of Academic Program Review Team for the Department of Geography at Texas State University in San Marcos, Texas.

President of the Advisory Board for evaluation of the Master in Geospatial Science and Technology at the Polytechnic University of Puerto Rico for the Government of Puerto Rico

Program Committee of GIScience 2014 September the 14-17th in Zurich, Switzerland

Program Committee of GIScience 2010 September the 14-17th in Zurich, Switzerland

Proposal Reviewer for European Science Foundation (ESF)

NSF and Resources for the Future workshop on integrating the social science into the NSF environmental observatories (January 2007)

EPA panel to review STAR (Science to Achieve Results) fellowship proposals (March 2007 & January 2008)

Curriculum and Degree Review committee for Department of Geography, Population, and Environmental Management, Flinders University, Adelaide SA, Australia (September 2006)

Member of the Editorial Board of the International Journal of Ecological Economics and Statistics

Collaboration with National Geographic Society cartographers and writers in production of 'millenium series' special issue of National Geographic Magazine titled "Population and Resources" (This issue [October 1998] has a pull out map with the earth at night on one side)

Board Member Rocky Mountain URISA (Urban and Regional Information Society of America)

Service as an Editor/Peer Reviewer for the following Journals and Organizations:

The Annals of the Association of American Geographers	
Political Economy Science	American Economic Review, Nature
Ecology and Society	Proceedings of the National Academy of Sciences,
The Professional Geographer	Remote Sensing of the Environment,
Ecological Modeling	The International Journal of Remote Sensing,
Environmental Management	Photogrammetric Engineering and Remote Sensing,
Remote Sensing	Remote Sensing of Environment
Energy Policy	Computers, Environment & Urban Systems
Urban Geography	The National Science Foundation
Energies	The United States Geological Survey
Ecological Economics	The Environmental Protection Agency

Member of following professional organizations:

- Association of American Geographers
- International Society for Ecological Economics
- American Society of Photogrammetric Engineering and Remote Sensing
- Sigma Xi Scientific Research Society
- American Association of University Professors



## ONGOING RESEARCH INTERESTS

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### **The NightSat Mission**

As an Urban Metabolism Scientist, I do research that identifies and documents how the improved spatial and spectral resolution of nighttime satellite imagery derived data products will inform our understanding of the human-environment-sustainability problematic as it pertains to the following: urban growth and land use patterns, mapping and monetizing the human ecological footprint, and characterizing the megapolitan-urban-exurban gradient and its impacts on ecosystem function, habitat fragmentation, and ecosystem services.

### **Geo-location and Radiance Calibration of the DMSP OLS Sensor**

I have been using data products derived from the Defense Meteorological Satellite Program's Operational Linescan System (DMSP OLS) for myriad applications. This work has contributed to the justification for the aforementioned NightSat mission. The coarse spatial and spectral resolution of the DMSP OLS presents many uncertainties with respect to spatial and radiometric accuracy of the sensor. I have been working with Dr. Sharolyn Anderson and her PhD student (Benjamin Tuttle) on characterizing and calibrating the DMSP OLS imagery by lighting up pixels in dark places using our own light source.

### **Valuation of Ecosystem Services**

I began a working relationship with Robert Costanza back in my days as a graduate student at UCSB in which I participated in the writing of a paper published in *Nature* titled: *The value of the world's ecosystems and natural capital*. As a result of this I became interested in the development of the discipline of ecological economics. Dr. Costanza and I have worked together on several other papers involving the interesting problems associated with trying to assign dollar values to ecosystem services. I use my expertise in GIS and spatial data analysis in collaborations with economists and ecologists to make spatially explicit valuations of ecosystem services.

### **Development of independent and objective Sustainability Metrics**

I have had a long interest in the idea of carrying capacity going back to my days as president of the Santa Barbara Chapter of Zero Population Growth and conversations with Paul Ehrlich, Garrett Hardin, Hunter Lovins, and Jared Diamond. I have developed some simple, easy to measure, and objective metrics of sustainability that correlate strongly with well-established metrics such as the Global Footprint Network's 'Ecological Footprint'. I collaborate with Alessandro Galli of the Global Footprint Network in this area.

### **Mapping Economic Activity using Nighttime Satellite imagery**

I worked closely with one of my PhD Students, Tilottama Ghosh, in the modeling of economic activity using the DMSP OLS data products. She successfully developed methods for estimating the fraction of the national economy of India and Mexico that is in the informal sector and mapped it. She also produced the first global map of GDP/capita at 1 km<sup>2</sup> spatial resolution. This work relating the estimation and mapping of economic activity using nocturnal satellite observations is gaining traction with researchers at Yale and UCLA.

### **Issues of Scale and Representation in Geographic Data**

Figuring out how best to represent spatially and temporally varying phenomena in a digital environment is a fascinating problem of scale, classification, and abstraction. The simple idea of representing the spatio-temporal variation of intra-urban population density is a good example of how this is not really a simple idea. In my efforts at modeling proxy measures of population density, economic activity, and ecosystem service value I have enjoyed struggling with these insurmountable problems and hope to make some contributions to methods that will inform our understanding of the roles these phenomena play in questions of sustainability.

### **Measuring Learning Outcomes for undergraduate Geography Students**

I am becoming increasingly interested in what it is, exactly, that we believe we are teaching to undergraduate geography students. I am appalled at the simplistic ways in which we use end of course student evaluations to measure teaching effectiveness. I applaud efforts at the development of instruments such as the AP Human Geography exam that attempt to actually measure what students of Geography have presumably learned. I also serve as an AP Geography exam reader. I intend to participate in this clarification of 'Learning Outcomes' for undergraduate degrees in Geography for the rest of my career because I think it is imperative that we as faculty in this discipline can answer questions like: "What will I learn from taking a degree in Geography that I won't learn from taking some other degree?"