

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)
2020 - 2021	Visiting Fellow at The Crawford School of Public Policy The Australian National University
2017-Present	Member of Board of Directors DRCOG
2015 – 2016	Head of Discipline: Env't & 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 – 2010	Research Associate at NGDC of NOAA in Boulder CO
1992 - 1999	Department of Geography, UC Santa Barbara 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
- Developing Indicators for the SDGs
- Ecosystem Services
- Integrated Assessment
- Urban metabolism and Smart Cities
- Green Infrastructure
- Wellbeing and Urbanization Science
- Land Degradation
- Applications of Nighttime Satellite imagery

Media & Public Outreach

Valuing Nature – [Engaging Ideas Forum](#) (DU)
A modest proposal: 'Kill all the bees' (ABC)
'Planet Talk' at WOMAD in Adelaide
Nature's Dividend ([NPR](#))
Exurban Sprawl ([CNN](#))
The Road to Idiocracy ([Boulder Daily Camera](#))
The Value of Nature ([The Denver Post](#))
Growth or Collapse ([The Ecologist](#))
The Decoupling Delusion ([The Conversation](#))
Wetlands Save Lives ([Story Map](#))
Pop of 15 million for Australia ([The Guardian](#))

HONORS AND AWARDS

Prose Award Winner for Environmental Sciences GEO6 (UNEP) (2021)
Best Researcher Award - IRULA (<https://www.rulaawards.com/>) (2019)
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 (2nd Place) (2005)
Award for Best Scientific Paper in Remote Sensing (3rd Place) (2005)
Boeing ASPRS Award for best paper in Image Analysis (1st 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)

FUNDED RESEARCH

From Salt to C: Carbon Sequestration through ecological restoration 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 Technology (\$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

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)

PUBLICATIONS

Google Scholar (July 2021) Total Citations: 41,891 h- index 46 i-10 index 82

[Google Scholar Site for Paul C. Sutton](#)

Robert Costanza, Sharolyn J. Anderson, Paul Sutton, Kenneth Mulder, Obadiah Mulder, Ida Kubiszewski, Xuantong Wang, Xin Liu, Octavio Pérez-Maqueo, M. Luisa Martinez, Diane Jarvis, Greg Dee (2021) **The global value of coastal wetlands for storm protection.** *Global Environmental Change* Volume 70 ISSN 0959-3780
(<https://www.sciencedirect.com/science/article/pii/S0959378021001072>)

Costanza, Robert; Kubiszewski, Ida; Kompas, Tom; **Sutton, Paul C.** (2021) **A Global MetaUniversity to Lead by Design to a Sustainable Well-Being Future.** *Frontiers in Sustainability* DOI=10.3389
<https://www.frontiersin.org/articles/10.3389/frsus.2021.653721/full>

Qi, B., Wang, X., & **Sutton, P.** (2021). **Can Nighttime Satellite Imagery Inform Our Understanding of Education Inequality?** *Remote Sensing*, 13(5), 843. doi:10.3390/rs13050843
<https://www.mdpi.com/2072-4292/13/5/843>

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<https://doi.org/10.1016/j.jenvman.2020.111381>

Obadiah J Mulder, Kenneth P Mulder, Ida Kubiszewski, Sharolyn J Anderson, Robert Costanza, **Paul Sutton** (2020) **The value of coastal wetlands for storm protection in Australia.** *Ecosystem Services* Vol 46. ISSN 2212-0416, <https://doi.org/10.1016/j.ecoser.2020.101205>

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Sannigrahi, S., Pilla, F., Basu, B., Basu, A.S., Zhang, Q., Wang, Y., Joshi, P.K., Chakraborti, S., Coscieme, L., Keesstra, S., Roy, P. and **Sutton, P.C.** (2020) **Identification of Conservation Priority Zones Using Spatially Explicit Valued Ecosystem Services: A Case from the Indian Sundarbans.** *Integrated Environmental Assessment and Management*, 16: 773-787.
<https://doi.org/10.1002/ieam.4287>

Ghosh Tilottama, Coscieme Luca, Anderson Sharolyn J., **Sutton Paul C.** (2020) **Building Volume Per Capita (BVPC): A Spatially Explicit Measure of Inequality Relevant to the SDGs.** *Frontiers in Sustainable Cities*. Vol 2 DOI=10.3389/frsc.2020.00037
<https://www.frontiersin.org/article/10.3389/frsc.2020.00037>

Srikanta Sannigrahi, Qi Zhang, P.K. Joshi, **Paul C. Sutton**, Saskia Keesstra, P.S. Roy, Francesco Pilla, Bidroha Basu, Ying Wang, Shouvik Jha, Saikat Kumar Paul, Somnath Sen (2020) **Examining effects of climate change and land use dynamic on biophysical and economic values of ecosystem services of a natural reserve region.** *Journal of Cleaner Production*. Volume 257. ISSN 0959-6526. <https://doi.org/10.1016/j.jclepro.2020.120424>

Biagio F. Giannetti, Feni Agostinho, Cecília M.V.B. Almeida, Gengyuan Liu, Luis E.V. Contreras, Carlo Vandecasteele, Luca Coscieme, **Paul Sutton**, Carlos Poveda. (2020) **Insights on the United Nations Sustainable Development Goals scope: Are they aligned with a 'strong' sustainable development?** *Journal of Cleaner Production*. Volume 252. ISSN 0959-6526
<https://doi.org/10.1016/j.jclepro.2019.119574>

Srikanta Sannigrahi, Qi Zhang, Francesco Pilla, Pawan Kumar Joshi, Bidroha Basu, Saskia Keesstra, P.S. Roy, Ying Wang, **Paul C. Sutton**, Suman Chakraborti, Saikat Kumar Paul, Somnath Sen (2020) **Responses of ecosystem services to natural and anthropogenic forcings: A spatial regression based assessment in the world's largest mangrove ecosystem.** *Science of The Total Environment*. Volume 715. ISSN 0048-9697, <https://doi.org/10.1016/j.scitotenv.2020.137004>

Sutton, Paul C. (2020) **The natural planetary foundation of the Sustainable Development Goals.** *AIMS Environmental Science* 7(4): 320-323 <http://www.aimspress.com/fileOther/PDF/environmental/Environ-07-04-020.pdf>

Ward, J., Mohr, S., Costanza, R., Sutton, P., & Coscieme, L. (2020). **Renewable Energy Equivalent Footprint (REEF): A Method for Envisioning a Sustainable Energy Future.** *Energies*, 13(23), 6160. doi:10.3390/en13236160 <https://www.mdpi.com/1996-1073/13/23/6160>

Wang, Xuantong.; Sutton, Paul. C.; Qi, Bing. (2019) **Global Mapping of GDP at 1 km² Using VIIRS Nighttime Satellite Imagery.** *ISPRS International Journal of Geo-Information*. 8(12), 580. <https://www.mdpi.com/2220-9964/8/12/580>

Coscieme, Luca, Mortensen, Lars.F., Anderson, Sharolyn., Ward, James., Donohue, Ian. and Sutton, Paul C., 2019. **Going beyond Gross Domestic Product as an indicator to bring coherence to the sustainable development goals.** *Journal of Cleaner Production*, p.119232. <https://www.sciencedirect.com/science/article/pii/S0959652619341022>

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Sutton, Paul C.; Peniche Camps, Salvador (2019) **Ecosystem Services Valuation of Mesoamerica and the Caribbean** https://www.todostuslibros.com/libros/ecosystem-services-valuation-of-mesoamerica-and-the-caribbean_978-84-17840-25-9

Robert Costanza, Elizabeth Caniglia, Lorenzo Fioramonti, Ida Kubiszewski, Henry Lewis, Hunter Lovins, Jacqueline McGlade, Lars Fogh Mortensen, Dirk Philipsen, Kate Pickett, Kristín Vala Ragnarsdóttir, Debra Roberts, Paul Sutton, Katherine Trebeck, Stewart Wallis, James Ward, Michael Weatherhead, Richard Wilkinson (2019) **Toward a sustainable wellbeing economy** *The Solutions Journal* 9(2) <https://www.thesolutionsjournal.com/article/toward-sustainable-wellbeing-economy/>

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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 [Online](#)

- 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. <https://www.mdpi.com/2071-1050/10/8/2826>
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- Robert Costanza, Rudolf de Groot, Leon Braat, Ida Kubiszewski, Lorenzo Fioramonti, Paul Sutton, Steve Farber, Monica Grasso (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.
<https://www.sciencedirect.com/science/article/abs/pii/S2212041617304060>
- Feng Li, Paul C. Sutton, Sharolyn J. Anderson & Hamideh Nouri (2017) **Planning green space in Adelaide city: enlightenment from green space system planning of Fuzhou city (2015-2020),** *Australian Planner*, 54:2, 126-133, DOI: 10.1080/07293682.2017.1345962
<https://www.tandfonline.com/doi/abs/10.1080/07293682.2017.1345962>
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<https://www.sciencedirect.com/science/article/abs/pii/S2212041617303960>
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<https://www.tandfonline.com/doi/abs/10.1080/15481603.2016.1260676>

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<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0164733>

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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>.
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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
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- 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
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- Ray, John; Sutton, Paul (2002) The National Park Service Air Atlas (an ArcIMS site for dissemination of spatially interpolated air quality parameters) <https://www.nps.gov/gis/mapbook/tech/45.html>
- Blom, Ronald; Sutton, Paul; Yetman, Gregory G.; Nghiem, Son; Balk, Deborah; Wannebo, Antoinette; Small, Christopher; Deichmann, Uwe; Chen, Robert S.; Rodriguez, Ernesto; Houshmand, Bijan; Neumann, Greg (2001) Global Infrastructure: The Potential of SRTM Data to Break New Ground White Paper for CIESIN at Columbia University
<https://academiccommons.columbia.edu/doi/10.7916/D8HQ47BT>
- 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; (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
- 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

Sutton, Paul (2018) *Using Geo-spatial data to develop 'Apples to Apples to Apples' metrics of urban sustainability*. 38th 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

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

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

Do the limits to growth apply to smart cities that have achieved the sustainable development goals?

Keynote for a debate forum sponsored by the Department of Public Policy at the College of Liberal Arts and Sciences City University of Hong Kong 2021 via Zoom

The global value of storm protection services provided by Coastal Wetlands in Dollars and Lives

Colloquium for the Department of Geography at the University of Tasmania April 21, 2021

The natural planetary foundation of the sustainable development goals Keynote for the International

Symposium on Water, Ecology, and the Environment (ISWEE 2020) done via Zoom December 6th 2020

The value of Nature Texas State Geography Department Colloquium San Marcos, Texas March 13, 2019

The Real Wealth of Nations: Quantifying environmental sustainability (or lack thereof) for the world's

nations Scenarios Forum 2019: Forum on Scenarios for Climate and Society Futures University of Denver Denver, CO March 11th 2019

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

Foundations of Urbanization Science: Mapping and Measuring Global Urban Metabolism At the meeting of the Human Planet Initiative, University of Twente, Enschede, Netherlands Sept 13th, 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 2nd, 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 15th 2015

The earth from Space at Night Grad and Faculty Seminar Series Colorado State University Oct 3rd, 2014

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 19th, 2010

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

The Earth at Night from Space: How nighttime satellite imagery informs our understanding of sustainability at Loreto College in Calcutta, India December 14th, 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) 1st 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) 2nd 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) 2nd 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 17th, 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

TEACHING

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](#):

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

Xuantong Wang (PhD 2020): Using Multi-Source Data to Assess the Dynamics of Socioeconomic Development in Africa

Joshua Baldwin (PhD 2020): Urban Green Space: Mitigator or Multiplier of Inequality in the Denver Metropolitan Area

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 2012): Identifying similar biophysical characteristics among nesting beaches of green turtles of Turkey using remote sensing techniques.

Tilottama Ghosh (PhD 2010): Shedding light on the spatial distribution of economic activity using nighttime satellite imagery

Lisa Piscopo (PhD 2004): 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

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 (for numerous years)
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, 2015-2017)
Graduate Admissions Committee
Graduate Standards Committee
MS GIS Committee
Departmental IT Committee
Steering Committee work for Undergraduate and Graduate Curriculum Planning

Community Service

Elected to the Board of Trustees for the Town of Morrison, Colorado
Member of the Board of Directors Denver Regional Council of Governments (DRCOG)
Member of the Planning Commission for the Town of Morrison, Colorado
Basketball coach for 5th & 6th Grade boys YMCA basketball league (“The Flying Spaghetti Monsters”)
Volunteer for Project Pride (Outdoor Environmental Education) at Red Rocks Elementary School
Judge and “Alex Trebek 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 & Regional Info 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	American Economic Review,
Science	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

Community Engaged Scholarship oriented toward Human and Ecological Wellbeing

I have contributed to the development of the Wellbeing Economy Alliance ([WEALL](#)). WEALL is a collaboration of organizations, alliances, and individuals working toward a wellbeing economy, delivering human and ecological wellbeing. Specific projects include conducting a noise pollution study in the town of Morrison, CO, establishing the neighborhood of Carrickalinga, South Australia as a designated Dark Sky Community, and contributing to the development of a Human and Ecological Wellbeing website for the Beyond GDP project currently taking place at DU. My vision of community engaged scholarship is focused on participating in the political process to effect solutions oriented change to move us toward an equitable, sustainable, and desirable future.

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 numerous 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, Mathis Wackernagel, William Rees, 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 Ilcheong Yi of the United Nations Research Institute for Social Development (UNRISD) and Alessandro Galli of the Global Footprint Network in these areas.

Mapping Economic Activity using Nighttime Satellite imagery

I work closely with my PhD Students (Tilottama Ghosh and Xuantong Wang), in the modeling of economic activity using the DMSP OLS and VIIRS data products. Dr. Ghosh 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 km² spatial resolution. Dr. Wang has improved these maps by applying them to VIIRS data and incorporating agricultural land use into the models. 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 and Environmental Science Students

I am becoming increasingly interested in what it is, exactly, that we believe we are teaching to undergraduate geography and environmental science students. I am appalled at the 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 measure what students of Geography have presumably learned. 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?*"

The NightSat Mission and Urban Metabolism

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.