

# Benjamin T. Tuttle, PhD

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## Education

### **University of Denver**

PhD Geography — 2007 - 2012

Dissertation Title: Aladdin's Magic Lamp: Developing Methods For Calibration And Geolocation Accuracy Of The DMSP-OLS

MS GIS — 2005 - 2007

Thesis Title: Virtual Globes: An Overview of Their History, Uses, and Future Challenges

### **University of Colorado, Boulder**

BA Geography — 1996 - 2001

Emphasis on Remote Sensing, GIS, and Cartography

BA Environmental Studies — 1996 - 2001

Emphasis on Environmental Analysis

### **University College Dublin, Ireland**

One Year Study Abroad Program — 1998 - 1999

One year of coursework with an emphasis on Zoology and Botany

## Experience

### **Project Scientist, National Geospatial-Intelligence Agency**

Aurora, CO — 2010 - Present

Research & Development in the Geospatial Intelligence Advancement Testbed (GIAT). Served as the GIAT Mobile Apps Team Lead.

### **GIS/RS Scientist, Cooperative Institute for Research in Environmental Sciences**

Boulder, CO — 2001 - 2010

Carried out Research & Development efforts at the National Geophysical Data Center.

### **Geospatial Developer, Waterstone, Inc**

Boulder, CO — 2007 - 2008

Part time position developing geospatial web solutions.

### **Teaching Assistant, University of Denver, Department of Geography**

## Denver, CO — 2007 - 2010

Teaching assistant for Application Design and Production, Geographic Information Analysis, GIS Modeling, Human Population, Introduction to Cartography, Introduction to GIS, Introduction to Statistics, and Our Dynamic Earth.

## Research Assistant, University of Denver, Department of Geography

Denver, CO — 2005 - 2007

Internship at Esri Denver Regional Office performing map design, supporting ArcGIS Server application development using VB .NET and ASP .NET, and database design/implementation.

## Research Assistant, Cooperative Institute for Research in Environmental Sciences

Boulder, CO — 1998 - 2001

Supported Research & Development efforts at the National Geophysical Data Center.

## Fellowships and Awards

### NASA Earth & Space Science Fellowship

2008 - 2011

### ASPRS Rocky Mountain Region Scholarship

2007 - 2008

## Professional Memberships & Service

- **Association of American Geographers**
  - Chair - Cyber-Infrastructure Specialty Group (2011-2012)
  - Vice-Chair - Cyber-Infrastructure Specialty Group (2010-2011)
  - Chair - Application Visualization Committee' Cyber-Infrastructure Specialty Group (2009-2011)
  - Student Director - Remote Sensing Specialty Group (2008-2010)
- **American Geophysical Union**
- **American Society for Photogrammetry and Remote Sensing**
  - President - University of Denver Student Chapter (2008-2010)
- **FOSS4G 2011 Organizing Committee**
  - Chair - Workshop Committee

## Technical Skills

- ArcGIS
- ENVI/IDL
- Image Science
- Cartography
- Minnesota MapServer/Mapscript
- OpenGeo Suite
- HTML/CSS
- PostGIS/PostgreSQL
- OGC Standards (including KML, WMS, WCS, WFS, SLD, GeoPackage)
- C# .NET

- Ruby/JavaScript/PHP/Python/PERL
- Geoweb App Development/Architecture
- Mobile App Architecture/Development/Licensing
- Development of Technical Requirements
- Technical design & development
- Android & iPhone
- JMP

## References

Available upon request.

## Selected Publications

Tuttle, B.T., Anderson, S., Sutton, P. C., Elvidge, C., Baugh, K.E., 2013, It Used To Be Dark Here: Geolocation Calibration of the Defense Meteorological Satellite Program Operational Linescan System, *Photogrammetric Engineering & Remote Sensing*, 79(3):287-297

Sutton, P. C., Anderson, S. J., Tuttle, B. T., Morse, L., 2012, The Real Wealth of Nations: Mapping and Monetizing the Human Ecological Footprint, *Ecological Indicators*, 16:11-22

Ziskin, D., Aubrecht, C., Elvidge, C., Tuttle, B, Eakin, C. M., Strong A. E., Guild, L. S., 2011, Describing coral reef bleaching using very high spatial resolution satellite imagery: experimental methodology. *Journal of Applied Remote Sensing*, 5

Elvidge, C.D., Baugh, K.E., Sutton, P.C., Bhaduri, B., Tuttle, B.T., Ghosh, T., Ziskin, D., Erwin, E.H., 2011, "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

Anderson, S.J. and Tuttle, B.T., 2010, Client/Server Architectures in *Encyclopedia of Geography*, (Warf, B. editor). Thousands Oaks, CA: SAGE Publications, Inc.

Anderson, S. J., Tuttle, B. T., Powell, R. L., Sutton, P. C., 2010, Characterizing Relationships Between Population Density and Nighttime Imagery for Denver, CO: Issues of Scale and Representation, *International Journal of Remote Sensing*, 31(21):5733-5746

Elvidge C.D., Keith D.M., Tuttle B.T., Baugh K.E., 2010, "Spectral Identification of Lighting Type and Character", *Sensors*, 10(4), 3961-3988

Ghosh, T., Elvidge, C. E., Sutton, P. C., Baugh, K. E., Ziskin, D., Tuttle, B.T., 2010, Creating a Global Grid of Distributed Fossil Fuel CO2 Emissions from Nighttime Satellite Imagery, *Energies*, 3(12):1895-1913

Elvidge, C.E., Tuttle, B.T., Sutton, P., 2009, Collaborative tool for collecting reference data on the density of constructed surfaces worldwide. 6th International Symposium on Digital Earth, Beijing, China

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*, Shanghai, China

Elvidge, C. D., P. C. Sutton, T. Ghosh, B. T. Tuttle, K. E. Baugh, B. Bhaduri, and E. Bright, 2009, A Global Poverty Map Derived from Satellite Data. *Computers and Geosciences*, 35,1652-1660

Elvidge, C. D., Ziskin, D., Baugh, K. E., Tuttle, B. T., Ghosh, T., Pack, D. W., Erwin, E. H., Zhizhin, M., 2009, A Fifteen Year Record of Global Natural Gas Flaring Derived from Satellite Data. *Energies*, 2 (3), 595-622

Elvidge, C.D., Sutton, P.C., Tuttle, B.T., Ghosh, T., Baugh, K.E, 2009, Global Urban Mapping Based on Nighttime Lights, Chapter 6 in *Global Mapping of Human Settlement*, (Gamba, P. and Herold, M. editors), CRC Press, p. 129-144

Kiran Chand, T.R., Badarinath, K.V.S., Elvidge, C.D., Tuttle, B.T., 2009, Spatial characterization of electrical power consumption patterns over India using temporal DMSP-OLS night-time satellite data. *International Journal of Remote Sensing*, 30(3), 647-661

Aubrecht, C, Elvidge, C. D., Longcore, T., Rich, C., Safran, J., Strong, A. E., Eakin, C. M., Baugh, K. E., Tuttle, B. T., Howard, A. T., Erwin, E. H., 2008, A global inventory of coral reef stressors based on satellite observed nighttime lights. *Geocarto International*, 23(6), 467-479

Elvidge, C.E., Tuttle, B.T., 2008, How virtual globes are revolutionizing earth observation data access and integration. *ISPRS Congress Beijing, Proceedings of Commission VI, Volume XXXVII, Part B6a, WGVI/4: Internet Resources and Datasets*, ISSN 1682-1750

Tuttle, B.T., Anderson, S., Huff, R., 2008, Virtual globes: An overview of their history, uses, and future challenges. *Geography Compass*, 2(5), 1478-1505

Chand, T.R.K., Badarinath, K.V.S., Murthy, M.S.R., Rajshekhar, G., Elvidge, C.D., Tuttle, B.T., 2007, Active forest fire monitoring in Uttaranchal State, India using multi-temporal DMSP-OLS and MODIS data. *International Journal of Remote Sensing*, 28(10), 2123-2132

Elvidge, C.D., Safran, J., Tuttle, B.T., Sutton, P., Cinzano, P., Petit, D., Arvesen, J., Small, C., 2007, Potential for global mapping of development via a Nightsat mission. *GeoJournal*, 69,45-53.

Elvidge, C.D., Tuttle, B.T., Sutton, P.C., Baugh, K.E., Howard, A.T., Milesi, C., Bhaduri, B., Nemani R., 2007, Global distribution and density of constructed impervious surfaces. *Sensors*, 7,1962-1979

Elvidge, C.D., Milesi, C., Dietz, J.B., Tuttle, B.T., Sutton, P.C., Nemani, R., Vogelmann, J.E., 2004, U.S. constructed area approaches the size of Ohio. *EOS Transactions, American Geophysical Union*, 85, 233.

Elvidge, C.D., Safran, J., Nelson, I.L, Tuttle, B.T., Hobson, V.R., Baugh, K.E., Dietz, J.B., Erwin, E.H., 2004, Area and position accuracy of DMSP nighttime lights data. Chapter 20 In *Remote Sensing and GIS Accuracy Assessment* (Lunetta R.S. and Lyon, J.G. editors), CRC Press, 281-292

Elvidge, C.D., Hobson, V.R., Nelson, I.L, Safran, J.M., Tuttle, B.T., Dietz, J.B., Baugh, K.E., 2003, "Overview of DMSP-OLS and scope of applications - Chapter 13", *Remotely Sensed Cities*, 281-299

Elvidge, C.D., Imhoff, M.L., Baugh, K.E., Hobson, V.R., Nelson, I., Safran, J., Dietz, J.B., Tuttle, B.T., 2001, Nighttime lights of the world: 1994-95. *ISPRS Journal of Photogrammetry and Remote Sensing*, 56,81-99

## Selected Panels, Presentations, & Posters

Pickle, E., Tuttle, B.T., Campbell, J., Lyon, L., 2013-02-28: Tearing Down The Wall: Procuring and Deploying Open Source GeoTools. Fed Geo Day, Washington, D.C., USA -Panel Participant

Tuttle, B.T., King, W. S., 2012-09-16: Leveraging Open Source Tools in Support of Disconnected Mobile Map Caches. Workshop on "The Internet and Geospatial Technologies" at AutoCarto 2012, Columbus, OH, USA -Workshop Lead

Tuttle, B. T., Anderson, S., Sutton, P., Elvidge, C., Powell, R., 2012-2-28: Aladdin's Magic Lamp: Calibrating the DMSP-OLS with an Active Target. Association of American Geographers Annual Meeting, New York, NY, USA -Oral Presentation

Tuttle, B. T., Jenkins, A., Crossler, J., White, A. Demmy, G., Hendricks, M., 2011-10-16: People and Technology: New Sensing Paradigm for Geospatial Data Collection and Integration, GEOINT Symposium, San Antonio, TX, USA -Panel Participant

Craun, K., Tuttle, B. T., Ball, M., 2011-10-16: Mobile GEOINT Applications, GEOINT Symposium, San Antonio, TX, USA -Panel Participant

Tuttle, B. T., 2011-5-2: Nighttime Lights Research & Applications. American Society of Photogrammetry and Remote Sensing Annual Meeting, ENVI User Group, Milwaukee, WI, USA -Oral Presentation

Tuttle, B. T., Anderson, S., Sutton, P., Elvidge, C, Baugh, K., Powell, R., 2011-4-13: Aladdin's Magic Lamp: A methodology for improving nighttime lights time series analysis. Association of American Geographers Annual Meeting, Seattle, WA, USA -Poster

Tuttle, B. T., Anderson, S., Sutton, P., Elvidge, C., Powell, R., Baugh, K., 2010-4-16: Aladdin's Magic Lamp: Building an Active Calibration Target for the Defense Meteorological Satellite Program Operational Linescan System (DMSP OLS). Association of American Geographers Annual Meeting, Washinton D.C., USA -Oral Presentation

Tuttle, B.T., Sutton, P., Anderson, S., Elvidge, C.D., 2009-3-22: Developing a web-based collaborative mapping tool to map impervious surface globally. Association of American Geographers Annual Meeting, Las Vegas, NV, USA -Oral Presentation

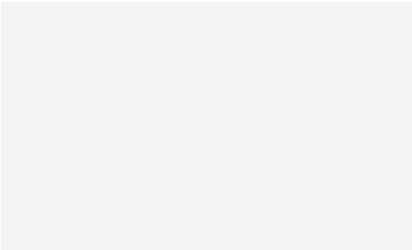
Edsall, R., Tuttle, B., Moskal, M., Dunbar, M., 2008-4-28: The interface between cartography and remote sensing. The American Society for Photogrammetry and Remote Sensing Annual Conference, Portland, OR, USA -Panel Participant

Tuttle, B.T., Anderson, S., Elvidge, C., Sutton, P., Baugh, K., 2008-4-15: Validating DMSP-OLS and MODIS fire detections with nighttime Landsat. Association of American Geographers Annual Meeting, Boston, MA, USA -Poster

Tuttle, B.T., Elvidge, C. E., 2008-10-22: Gas flaring as observed within Google Earth. Scientific Applications With Google Earth Conference, Ann Arbor, MI, USA -Poster

Tuttle, B.T., C. Elvidge, 2007-8-27: Web Mapping Service development for DMSP satellite data. 24th Asia Pacific Advanced Network (APAN) Meeting, Beijing, China -Oral Presentation

Tuttle, B.T., C. Elvidge, K. Baugh, A. Howard, 2007-1-9: DMSP detection of active



fires. Global Estimation of Biomass using the Next Generation Sensor Workshop -  
Hosted by the University of Tokyo, Tokyo, Japan -Oral Presentation

Tuttle, B.T., C. Elvidge, K. Baugh, R. Nemani, C. Milesi, P. Sutton, 2007-4-17:  
Global mapping of impervious surface area. American Geographers Annual  
Meeting, San Francisco, CA, USA -Oral Presentation