

## Curriculum Vitae – Sucharita Gopal

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### Professional Preparation

1983-1988 PhD in Geography, University of California at Santa Barbara, Santa Barbara, CA.  
1981-1983 MPhil in Geography, Madras University, Madras, India.  
1979-1980 BEd, Madras University, Madras, India.  
1977-1979 MSc in Geography, Madras University, Madras, India.  
1974-1977 BA in Geography, Madras University, Madras, India.

### Appointments

2010-Present Research Professor, Pardee Center for the Study of the Longer-Range Future  
2011-Present Research Professor, Boston University Marine Program (BUMP)  
2003-Present Professor, Department of Geography, Boston University, Boston, MA  
2008-2009 Education Thrust Leader NSF Center of Excellence for Learning in Education, Science, and Technology (CELEST)  
2001 - 2011 Research Associate Professor, CNS Technology Lab, Boston University, Boston, MA.  
2001 - 2003 Research Associate Professor, Boston University Center for Leading in a Dynamic Economy (BUILDE), School of Management, Boston University.  
1996- 2003 Associate Professor, Department of Geography, Boston University, Boston, MA  
1993-1997 Visiting Research Fellow, Department of Social and Economic Geography, Wirtschaftsuniversitat, Vienna, Austria  
1989-1995 Assistant Professor, Department of Geography, Boston University, Boston, MA  
1989 Post-Doctoral Fellow, National Center for Geographic Information Analysis, University of California, Santa Barbara, CA

### Service

2014 - Seven Year Medical Students Panel, Boston University, MA.  
2011 – Pardee Center Research Faculty, Boston University, MA.  
2011 – Board member, The Regional Association for Research on the Gulf of Maine (RARGOM)  
2010 - 2011 Departmental Faculty recruitment committee, Department of Geography & Environment, Boston University, MA.  
2009 – 2011 Director of Graduate Studies, Department of Geography & Environment, Boston University, MA.  
2009 – 2012 Faculty Advisor, BUMP Program (Marine GIS course), Boston University, MA.  
2008- 2010 CELEST Board Member, Center for Cognitive and Neural Systems, Boston University  
2007- 2008 Supervision of two Spanish students from University of Alicante, Spain.  
2007- 2008 Director of Graduate Studies, Department of Geography, Boston University, MA.  
2007-2008 Departmental Faculty recruitment committee, Department of Geography, Boston University, MA.  
2005-2006 Boston University UPT Committee (University Promotions and Tenure)

2006-2008 Panelist, NSF for Methodology, Measurement and Statistics, National Science Foundation  
Fall 2006 Associate Chair, Department of Geography and Environment  
1998 - 2000 Director of Graduate Studies, Department of Geography, Boston University, MA.  
1999 -2001 NSF Geography and Regional Science Panel Member  
2000 - 2001 EPA STAR Fellowship Panel Member

### Memberships

Corresponding Member of the IGU commission on Mathematical Models, Association of American Geographers, National Geographic Society University Consortium of Geographic Information Sciences (UCGIS).

**Editorial Board** – Geographical Analysis, Computer, Environment and Urban Systems

### Special Awards and Invited Speaker

**1995 ERDAS Award** (With Curtis Woodcock) for Best Science Paper in Remote Sensing, American Society of Photogrammetry and Remote Sensing for the paper: Gopal, S., and C.E. Woodcock, 1994. Theory and Methods for Accuracy Assessment of Thematic Maps Using Fuzzy Sets, *Photogrammetric Engineering and Remote Sensing*, 60(2):181-188 .

**Dangermond Lecture Series Speaker 2005** - Annual Lecture Series  
Jack Dangermond Speaker (2005) and delivered the annual lecture at ESRI headquarters in Redlands CA, University of Redlands CA and UC Santa Barbara in May 2005.

**The 27<sup>th</sup> Darwin Festival at Salem State College, Salem MA Feb.11, 2007.**The eternal triangle: Science, People and public policy in managing and sustaining marine areas. *Sponsored by the Department of Geography and the Charles Albert Read Trust.*

### Citations Index

**Sucharita Gopal**

**Publications: 58 | Citations: 1577 | G-Index: 39 | H-Index: 19. Interests: Geodesy & Remote Sensing, Engineering.**

### S. Gopal - List of Publications

#### Scholarly Books

Goodchild, M., and Gopal, S. (Eds.). *The Accuracy of Spatial Databases*, Francis and Taylor, London, 1990.

#### Original Articles

Simonett, D., Barrett, T., Gopal, S., Holsmuller, F., and Veregin, H. Magnitude and spatial distribution of combustible materials in San Jose area, California, *Fire and Materials*, 12, 95-108, 1988.

Gopal, S., Klatzky, R., and Smith, T. NAVIGATOR: A psychologically based model of environmental learning through navigation, *Journal of Environmental Psychology*, 9, 309-331, 1989.

Gopal, S., and Smith, T. NAVIGATOR: A psychologically based model of human way-finding in an urban environment, in M. Fischer, P. Nijkamp and Y. Papageorgiou (Eds.), *Spatial Choices and Processes*, pp. 169-200, North Holland Press: Amsterdam, 1990.

Gopal, S., and Smith, T. Human way-finding in an urban environment: a performance analysis using a computational processing approach, *Environmental and Planning A*, 22, 169-191, 1990.

Self, C., Gopal, S., Golledge, R., and Fenstermaker, S. Gender-related differences in spatial abilities, *Progress in Human Geography*, 16, 3, 315-342, 1992.

Fischer, M.M. and Gopal, S. Neurocomputing-a new paradigm for geographic information processing, *Environment and Planning A*, 25(6), 757-760, 1993.

Gopal, S., and Woodcock, C. Theory and methods for accuracy assessment of thematic maps using fuzzy sets, *Photogrammetric Engineering and Remote Sensing*, 60, 2, 181-188, 1994.

Woodcock, C.E., Collins, J., Gopal, S., Jakabhazy, V., Li, X., Macomber, S., Ryherd, S., Wu, Y., Harward, V.J., Levitan, J., and R. Warbington. Mapping forest vegetation using Landsat TM imagery and a canopy reflectance model, *Remote Sensing of Environment*, 50, 240-254, 1994.

Gopal, S. and Fischer, M. The application of artificial neural networks in remote sensing and pattern recognition in Ernste, Huib (Ed.), *Pathways to Human Ecology*, pp. 17-35, Steiner Verlag, Wiesbaden, 1994.

Fischer, M., and Gopal, S. Neural network models and interregional telephone traffic: comparative performances between multilayer feedforward networks and the conventional spatial interaction model, *Journal of Regional Science*, 34,4, 503-527, 1995.

Gopal, S., and Scuderi, L. Predicting sunspot cycles using feedforward neural networks, *Geographical Analysis*, 27(1), 42-60, 1995.

Gopal, S. and Fischer, M. Learning in single hidden layer feedforward neural network models: backpropagation in a spatial interaction modeling context, *Geographical Analysis*, 28 (1), 38-55, 1996.

Gopal, S., Neural network models of cognitive map in Portugali, J. (Ed.) *The Construction of Cognitive Map*, pp. 69-85, Amsterdam: Kluwer Academic Publishers, 1996.

Gopal, S., Woodcock, C., and Unis, G. Optimizing rules for labeling polygons for per-pixel classification using fuzzy sets, *Geographical Systems*, 2, 83-101, 1996.

Gopal, S. and Woodcock, C. E. Remote sensing of forest change using artificial neural networks, *IEEE Transactions on Geoscience and Remote Sensing*, 34 (2), 398-404, 1996.

Abuelgasim, A., Gopal, S., Irons, J., Strahler, A. Classification of ASAS multiangle and multispectral measurements using artificial neural networks, *Remote Sensing of Environment*, 57(2), 79-87, 1996.

Woodcock, C E., Gopal, S. and Albert, W. Evaluation of the potential for providing secondary labels in vegetation maps, *Photogrammetric Engineering and Remote Sensing*, 62 (4), 393-399, 1996.

Moody, A. and Gopal, S. and Strahler, A. H. Sensitivity of neural networks to subpixel land-cover mixtures in coarse-resolution satellite data, *Remote Sensing of Environment*, 58, 329-343, 1996.

- Carpenter, G., Gjata, M., Gopal, S., and Woodcock, C. ART networks in Remote Sensing, *IEEE Transactions on Geoscience and Remote Sensing*, 35(2), 308-325, 1997.
- Fischer, M M., Gopal, S., Stauffer, P. and Steinocher, K. Evaluation of neural pattern classifiers for a remote sensing application, *Geographical Systems*, 4, 195-225, 1997.
- Gopal,S. and Fischer, M. Fuzzy ARTMAP - A Neural Classifier for Multispectral Image Classification, in Fischer, M.M. and Getis, A. (eds.): *Recent Developments in Spatial Analysis: Spatial Statistics, Behavioural Modelling and Computational Intelligence*, pp. 306-35. Springer, Heidelberg, 1997.
- Abuelgasim, A., Gopal, S., and Strahler, A. Forward and inverse modeling of canopy directional reflectance using a neural network, *International Journal of Remote Sensing*, 19 (3), 453-471, 1997.
- Carpenter, G., Gopal, S., Martens, S., and Woodcock, C. *Evaluation of mixture estimation methods for vegetation mapping*, Technical Report CAS/CNS-97-014, Boston University, 1997.
- Albert, W. Reinitz, M., Beusmans, J. and Gopal, S. The role of attention in spatial learning during simulated route navigation, *Environment and Planning A*, 31, 1459-1472, 1999.
- Carpenter, G., Gopal, S., Martens, S., and Woodcock, C. A Neural Network Method for Mixture Estimation for Vegetation Mapping, *Remote sensing of the Environment*, 70 (2), 138-152, 1999.
- Gopal, S., Woodcock, C. and Strahler, A. Fuzzy ARTMAP classification of global land cover from the 1 degree AVHRR data set, *Remote Sensing of the Environment*, 67, 230-243, 1999.
- Abuelgasim, A., Ross, W. D., Gopal, S., and Woodcock, C. E. Change detection using adaptive neural networks: Environmental damage assessment after the Gulf War, *Remote Sensing of the Environment*, 70 (2), 208-223, 1999.
- Gopal, S. and Woodcock, C. E. Artificial Neural Networks for Detecting Forest Change in Chen, C.H. (ed.), *Information Processing for Remote Sensing*, pp. 225-236, World Scientific: Singapore, 1999.
- Kaufmann, R. K., Snell, S. E., Gopal, S. and Dezzani, R. The significance of synoptic patterns identified by the Kirchhofer technique: A Monte Carlo approach, *International Journal of Climatology*, 19(6), 619- 626, 1999.
- Carpenter, G., Gopal, S., Macomber, S., Martens, S., Woodcock, C. and Franklin, J. A neural network method for efficient vegetation mapping, *Remote sensing of the Environment*, 70, 326-338, 1999.
- Woodcock, C. E. and Gopal, S. Fuzzy set theory and thematic maps: accuracy assessment and area estimation, *International Journal of Geographical Information Systems*, 14(2), 153-172, 2000.
- Snell, S. E., Gopal, S. and Kaufmann, R. K. Spatial interpolation of GCM forecasts using artificial neural networks, *Journal of Climate*, 13,886-895, 2000.
- Friedl, M.A., Woodcock,C., Gopal,S., Muchoney, D., Strahler, A. H., and C. Barker-Schaaf. A note on procedures used for accuracy assessment in land cover maps derived from AVHRR data, *International Journal of Remote Sensing*, 21, (5), 1073-1077, 2000.
- Muchoney, D., Borak, J., Chi, M., Friedl, M., Gopal, S., Hodges, J., Morrow, N., and A. Strahler, A. Application of the MODIS global supervised classification model to vegetation and land cover mapping of Central America, *International Journal of Remote Sensing*, 21, (6), 1115-1138, 2000.

Friedl, M.A., McIver, D., Hodges, J.C.F., Zhang, X., Gopal, S., Woodcock, C.E., and A.H. Strahler, Land Cover Mapping from MODIS: First Results and Future Directions, *8th International Symposium on Physical Measurements and Signatures in Remote Sensing*, ISPRS, 2001, p.3-8.

Pax-Lenney, M., Woodcock, C.E., Gopal, S., and Macomber, S. Monitoring temperate conifer forests with Landsat TM: A new look at classification generalization, *Remote Sensing of Environment*, 77(3): 241-250. 2001.

Liu, W., Gopal, S., and C.E. Woodcock, ARTMAP Multisensor/resolution Framework for Landcover Characterization, *Proceedings of 4th Annual Conference on Information Fusion*, Montreal, August, 2001, WeC2-11-16.

Liu, W., Gopal, S., and Woodcock, C. ARTMAP neural networks for image processing, interpretation, visualization. Invited Chapter in V. Kumar, R. Grossman, C. Kamath, and R. Namburu (Eds.) *Massive Computing*, pp Kluwer Academic Press, 2001.

Gopal, S., W. Liu and Woodcock, C. Visualization Based on the Fuzzy ARTMAP Neural Network for Mining Remotely Sensed Data, Invited Chapter in Harvey J. Miller and Jiawei Han (eds.), *Geographic Data Mining and Knowledge Discovery*, pp. 315-335, Taylor and Francis, 2001.

Gopal, S. and Fischer, M. Fuzzy ARTMAP - A Neural Classifier for Multispectral Image Classification, in Manfred M. Fischer and Yee Leung (eds), *Geocomputational Modelling : Techniques and Applications (Advances in Spatial Science)*, pp. 165-194. Springer Verlag: Heidelberg, 2001, [Reprint from Fischer, M.M. and Getis, A. (eds.): *Recent Developments in Spatial Analysis: Spatial Statistics, Behavioural Modelling and Computational Intelligence*, pp. 306-35. Springer, Heidelberg, 1997].

Ju, J., Kolaczyk, E.D., and Gopal, S. (2003). Gaussian mixture discriminant analysis and sub-pixel land cover classification in remote sensing. *Remote Sensing of Environment*, 84(4),550-560.

Legates, D.R., S. Gopal, and P. Rogerson, 2003: Mathematical Models and Quantitative Methods. *Geography in America at the Dawn of the 21<sup>st</sup> Century*. Oxford University Press, 442–457.

Weiguo Liu, Sucharita Gopal, and Curtis E. Woodcock (2004). Uncertainty and Confidence in Land Cover Classification Using a Hybrid Classifier Approach. *Photogrammetric Engineering and Remote Sensing*, 70 (8), 963-972.

Liu, W. , Karen Seto , Elaine Wu, Sucharita Gopal and Curtis Woodcock (2004). ART-MMAP: a neural network approach to sub-pixel classification, *IEEE Transactions on Geoscience and Remote Sensing* , 42(9).

Shabanov, N. V., Lo, K., Gopal, S., and R. B. Myneni (2005). Subpixel burn detection in Moderate Resolution Imaging Spectroradiometer 500-m data with ARTMAP neural networks *Journal of Geophysical Research*, Vol. 110,

Ju, J., Gopal, S., and Kolaczyk, E.D. (2005). On the choice of spatial and categorical scale in remote sensing land cover characterization. *Remote Sensing of Environment*, 96(1):62-77.

Proctor SP, Gopal S, Imai A, Wolfe J, Ozonoff D, White RF (2005). Spatial Analysis of 1991 Gulf War Troop Locations in Relationship with Postwar Health Symptom Reports Using GIS Techniques *Transactions in GIS*, Vol. 9, No. 3. (June 2005), pp. 381-396.

- Ju, J., Gopal, S., and Kolaczyk, E.D. (2005). On the choice of spatial and categorical scale in remote sensing land cover characterization. *Remote Sensing of Environment*, 96(1):62-77.
- Kolaczyk, E.D., Ju, J., and Gopal, S. (2005). Multiscale, multigranular statistical image segmentation. *Journal of the American Statistical Association*, 100, 1358-1369.
- Gopal, S. (2007). The evolving social geography of blogs, in Harvey J. Miller (ed.) *Societies and Cities in the Age of Instant Access*, Berlin: Springer, pages 275-294.
- D. Potere, C. E. Woodcock, A. Schneider, M. Ozdogan, A. Baccini, and S. Gopal (2007). Patterns in forest clearing along the Appalachian Trail corridor. *Photogrammetric Engineering and Remote Sensing*, volume 73, pages 783-791.
- Gopal, S., Vanelli, M. and Adams, M. (2008). Modeling the spatial patterns of addiction in the US. in D. Richardson and Y. Thomas. (Eds.) *Geography and Drug Addiction*, edited by Berlin: Springer-Verlag, pages 415-437.
- Gopal, S. (2009). Error in GIS (propagation and modeling), in Rob Kitchen and Nigel Thrift (Eds) *International Encyclopedia of Human Geography* Elsevier. Pages 586-594.
- Gandhi, J. M. Kang, S. Shekhar, J. Ju, E. D. Kolaczyk, S. Gopal, *Using a Context Approach to Process Statistical Queries in Raster Data: An Extended Abstract*, Accepted in the 1<sup>st</sup> International Workshop on Spatial and Spatial-temporal Data Mining (**SSTDM '06**), in conjunction with the IEEE 6<sup>th</sup> International Conference on Data Mining (**ICDM '06**), Hong Kong, December 18, 2006 (Selectivity: 1 out of 3). (Selected as one of the best papers and invited for an extended journal publication in the Knowledge and Information Systems (**KAIS**))
- Gopal, S., W. Liu and Woodcock, C. (2009). Multiscale Landcover Characterization using a Neural Network in Fischer and Getis (Eds) *Spatial Modeling and Analysis*, Springer: Hiedelberg, Germany, Pages 521-542.
- Yeshiwondim, Asnakew K., Gopal, S., Hailemariam, Afework T., Dengela, Dereje O. and Hrishikesh P. Patel (2009), "Spatial analysis of malaria incidence at the village level in areas with unstable transmission in Ethiopia" *International Journal of Health Geographics*, 8:5 (26 Jan 2009)
- Tyler, Zachary C. and S. Gopal (2010). Sub-Saharan Africa at Cross-Roads: A quantitative analysis of regional development. *THE PARDEE PAPERS*, No. 10 / MAY 2010
- Patel, H., Gopal, S., Kaufman, K., et al. (2011) "MIDAS: A Spatial Decision Support System for Monitoring Marine Management Areas" *International Regional Science Review*, April 2011 34: 191-214.
- Mann, Michael L. & Kaufmann, Robert K. & Bauer, Dana & Gopal, Sucharita & Vera-Diaz, Maria Del Carmen & Nepstad, Daniel & Merry, Frank & Kallay, Jennifer & Amacher, Gregory S., (2010). "The economics of cropland conversion in Amazonia: The importance of agricultural rent," *Ecological Economics*, Elsevier, vol. 69(7), pp 1503-1509.
- Michael Mann & Robert Kaufmann & Dana Bauer & Sucharita Gopal & James Baldwin & Maria Del Carmen Vera-Diaz, 2012. "Ecosystem Service Value and Agricultural Conversion in the Amazon: Implications for Policy Intervention," *Environmental & Resource Economics*, European Association of Environmental and Resource Economists, vol. 53(2), pages 279-295, October.

Gopal, S. and Najam, A. (2012). *Connecting the Dots: Information Visualization and Text Analysis of the Searchlight Project Newsletters*. Pardee Center for the Study of the Longer-Range Future, February 2012 (36 pages). ISBN: 978-1-936727-05-6.

Sucharita Gopal, (2012) "Global synthesis of Searchlight reports using knowledge discovery and visualization", *Foresight*, Vol. 14 Iss: 6, pp.468 – 488.

Irit Altman, Roel Boumans, Joe Roman, Suchi Gopal, and Les Kaufman (2013) *An Ecosystem Accounting Framework for Marine Ecosystem-Based Management* in Michael J. Fogarty (Editor), James J. McCarthy (Editor), *The Sea, Volume 16: Marine Ecosystem-Based Management* (The Sea: Ideas and Observations on Progress in the Study of the Seas) [Hardcover], Harvard University Press.

Kaufmann, RK, S. Gopal, X. Tang, S. M. Raciti, PE Lyons, N. Geron, and F. Craig, Revisiting the weather effect on energy consumption; implications for the impact of climate change, *Energy Policy*, Volume 62, November 2013, Pages 1377–1384.

Chan, DA, Helfrich, CA, Rogers, ES and Gopal, S. *Information Systems (GIS) and participatory mapping for people who were once homeless*. Health and Place, 2013.

Mann, M., Kaufmann, R. K., Bauer, DM, Gopal, S. Pasture conversion and competitive cattle rents in the Amazon, *Ecological Economics*. 97 (2014), 182-190

### **Book Reviews**

Placing history: How maps, spatial data and GIS Are Changing Historical Scholarship by Anne Kelly Knowles and Amy Hillier eds. ESRI Press, Redlands, CA, 2008. 313 pp. In the *Journal of Northeastern Geography*

### **Manuscripts in Review**

Maria Sagot, S. Gopal and Tigga Kingston, Testing for local spatial autocorrelation in ecological systems: A data fusion approach. *Ecology*, 2013. In review

Chan, D., Gopal, S., and Helfrich, C. Impact of geographic accessibility on community integration for people with disabilities who were once homeless, *Social Science & Medicine*. in Press

Everett, Lindsey L., Gopal, S., Thomas, M., Hamer, D. Spatial modeling of health facility utilization by expectant mothers in Kalomo, Zambia, *International Journal of Health Geographics*. In review

R.K. Kaufmann, Sucharita Gopal, Ubaldo Fernandez, Judith Rodriguez, Evangelia Kostopoulou (2013). National contributions to and responsibilities for enhanced CO2 radiative forcing. *Manuscript in review to Ecological Economics*

Newell, J.D., Hutyra, L.R., Phillips, N.G., Gopal, S., Woodcock, C.E., Olofsson, P. Combining multisource remotely sensed data to map urban tree canopy cover and carbon storage. *Remote Sensing of Environment*, in revision.

Gopal, S., Kaufman, L., Holden, C., Ribera, M., Pasquarella, V., Shank, B., & Pitts, J. "Modeling Coastal and Marine Environmental Risks in Belize using MIDAS". *Coastal Management*, 2013.

Gopal, S., Tang, X., Nomack, M. Fuzzy Classification of the Urban-Rural Gradient of Metro Boston, *International Journal of Geographic Information Science*.

Gopal, S., Kaufman, L., Pitts, J., Altman, I., Buerman, R. MIDAS/MIMES, *Decision Support Systems*.

### Conference Proceedings and Reports

Freundschuh, S., Mark, D., Gopal, S., Gould, M., and Couclelis, C. Verbal directions for wayfinding: Implications for navigation and geographic information and analysis systems, *Proc. of the 4th International Symposium on Spatial Data Handling*, Zurich, Switzerland, 1, pp. 478-487, 1990.

Woodcock, C., and Gopal, S. Accuracy assessment of the Stanislaus forest vegetation map using fuzzy sets, *Proc. of the Fourth Biennial Remote Sensing Applications Conference*, pp. 378-394, 1992.

Gopal, S. and Fischer, M.M. Neural net based interregional telephone traffic models, *Proceedings of International Joint Conference on Neural Networks*, Nagoya, Japan, 1993.

Gopal, S., Sklarew, D. M., and Lambin, E. Fuzzy-Neural Networks in Multi-temporal classification of Landcover Change in the Sahel, *Proceedings of the DOSES Workshop on New Tools for Spatial Analysis*, Lisbon, Portugal, DOSES, EUROSTAT, ECSC-EC-EAEC: Brussels, Luxembourg, pp. 55-68, 1994.

Woodcock, C.E., Gopal, S., Macomber, S.A., and V.D. Jakabhazy, 1994. Accuracy Assessment of the Vegetation Map of the Plumas National Forest, Technical Report, Center for Remote Sensing, Boston University, 19p.

Fischer, M. and Gopal, S. *Neurocomputing and spatial information processing: from general considerations to a low dimensional real world application*, *Proceedings of the DOSES Workshop on New Tools for Spatial Analysis*, Lisbon, Portugal, DOSES, EUROSTAT, ECSC-EC-EAEC: Brussels, Luxembourg, pp. 69-81, 1994.

Abuelgasim, Abdelgadir and Gopal, S. Classification of multiangle and multispectral ASAS data using a hybrid neural network model, *International Geoscience and Remote Sensing Symposium 1994*, Pasadena, CA, IEEE: Piscataway NJ, pp. 1670-1675, 1994.

Moody, A., Gopal, S., Strahler, A., Borak, J., and P. Fisher A combination of temporal thresholding and neural network methods for classifying multiscale remotely-sensed image data, *International Geoscience and Remote Sensing Symposium 1994*, Pasadena, CA, IEEE: Piscataway NJ, pp. 1877-1880, 1994.

Woodcock, C. and Gopal, S. Remote sensing of forests: New data layers for GIS, *Proc. ASPRS Conference*, 1995, Charlotte, N. Carolina, pp. 420-428.

Carpenter, G., Gjaja, M., Gopal, S., and Woodcock, C. ART networks in Remote Sensing, *International Geoscience and Remote Sensing Symposium 1996*, Vol 1, Lincoln, Nebraska, May 27-31, 1996, IEEE: Piscataway NJ, pp. 529-531.

Gopal, S., Woodcock, C., and Strahler, A.H. Fuzzy ARTMAP classification of global land cover from AVHRR data set, *International Geoscience and Remote Sensing Symposium 1996*, Vol 1, Lincoln, Nebraska, May 27-31, 1996, IEEE: Piscataway NJ, pp. 538-540.



Gopal, S. and Fischer M. A comparison of three neural network classifiers for remote sensing classification, *International Geoscience and Remote Sensing Symposium 1996*, Vol 1, Lincoln, Nebraska, May 27-31, 1996, IEEE: Piscataway NJ, pp. 787-789.

Abdelgadir A. Abuelgasim, Gopal,S. and Strahler, A.H. Forward and inverse modeling of canopy directional reflectance using a neural network, *International Geoscience and Remote Sensing Symposium 1996*, Vol 3, Lincoln, Nebraska, May 27-31, 1996, IEEE: Piscataway NJ, pp. 1426-1428.

Gopal, S. and Woodcock, C.E. Artificial Neural Networks for Detecting Conifer Mortality in Lake Tahoe, *Proc. Of the First International Conference Geospatial Information in Agriculture and Forestry*, Volume I, ERIM Publications: Ann Arbor, MI, 1998, pp. 589-596.

Woodcock, C.E., Gopal, S., Macomber, S., Pax-Lenney, M., (1998). Automated identification of temperate conifer forests in Landsat imagery: Generalization in time and space, *IGARSS 1998* (2), 801-803.

Woodcock, C.E., Macomber, S., Song, C., Pax-Lenney, M., Gopal, S. and W. Cohen (1999). Regional to continental monitoring of change in temperate conifer forests, *Pecora 14, LandSatellite Information III Proceedings*, APSRS, Denver, CO, December 6-10, pp.322-327.

Carpenter, G. A., Gopal, S., Macomber, S., Shock, B., and Woodcock, C.E. (1999). ARTMAP neural network classification for land use change, *Third International Conference on Cognitive and Neural Systems*, Boston University, Boston, MA. May 26-29, 1999.

Gopal, S. (1999). Spatial Technologies in Public Health, *Invited Talk, School of Public Health, Boston University*, October 14, 1999.

Gopal, S., and Woodcock, C.E. (2000). Pruning the Fuzzy ARTMAP Classification for Category Proliferation Problem *Fourth International Conference on Cognitive and Neural Systems*, Boston University, Boston, MA. 2000.

Invited Participant, Spatial Data Mining, *Workshop on Mining Scientific Datasets*, Army High Performance Computing Research Center, Minneapolis, MN, July 20-22, 2000.

Imai, A., Proctor, S. and Gopal, S. (2000). Spatio-temporal Analysis of Gulf war syndrome: Does GIS help? *VA Hospital*, Jamaica Plain, Boston, MA September 2000.

Carpenter, G., Gopal, S., Shock, B., and C.E. Woodcock, 2001. A neural network method for land use change classification with application to the Nile River Delta, Technical Report CAS/CNS- 01-10, Boston University Center for Adaptive Systems, Boston, Ma., 13p.

Shock, B., Carpenter, G., Gopal, S., and C.E. Woodcock, 2001. ARTMAP neural network classification of land use change, Technical Report CAS/CNS-01-09, Boston University Center for Adaptive Systems, Boston, MA., 8p.

Gopal, S. Invited Speaker, (2001). Spatial Technologies in the Insurance and Re-insurance Business, Applied Insurance Research-Boston, Boston, MA May 2001.

Gopal, S. (2001). Invited participant, *Biocomplexity Incubation Activity Workshop*, Indiana University, Bloomington Indiana, USA, September 26 - 28, 2001.

Gopal, S. (2001). Invited Speaker, *Lucent Seminar Series, BUILD E Global Mobility Initiative*, Boston University School of Management, Boston, MA October 5, 2001.

Gopal, S. (2001). Invited Speaker, Geographical Information Systems for Public Health, Business and Conservation, Boston University, School of Journalism, Boston, MA November 14, 2001.

Gopal, S. (2001). ARTMAP mixture models in Remote Sensing, CNS Technology Lab Presentations to Sponsors (Air Force Office of Scientific Research), Boston MA, November 13, 2001.

Gopal, S., W. Liu and Woodcock, C. (2001). ARTMAP Multisensor/resolution framework for landcover characterization, Invited Talk, *Proceedings of the 4<sup>th</sup> Annual Conference on Information Fusion*, Montreal Canada, August 7-10, 2001.

Gopal, S. (2001). Spatial technologies applications in Insurance Risk Estimation, Invited Talk at *Applied Research Insurance*, Boston, May.

Invited Talk on the “Geography of Blogs” Societies and Cities in the Age of Instant Access, Research Symposium on 10-12 November 2005. University of Utah Salt Lake City, UT, USA

Kolaczyk (presenter) Multiscale, Multigranular Image Analysis—American Statistical Association Meetings, Minneapolis, 2005

Virtual Worlds Workshop (Organized by the US Army/CIA), Social Networks/Virtual Worlds, Anna Tsao, Algotek (organizer), October 2005

Ju, J., Gopal, S. and Kolaczyk, E. [\*Land cover and land use mapping using a multiscale multigranular framework and remotely sensed data\*](#), Annual Association of American Geographers, Chicago, IL, March 8-12, 2006.

Gopal, Adams, M., Vanelli, M. and Albanese, M. *Modeling the spatial patterns of addiction in the US*. Invited Presentation at **NIDA/AAG Symposium on Geography and Drug Addiction**, March 8, 2006 Chicago IL.

Andris, C. Paletta, P., Ganguly, S., and Gopal, S. *Exploring the Relationship between the Social Geography and Environmental Susceptibility of the New Orleans Region*, **Annual Association of American Geographers**, Chicago, IL, March 8-12, 2006.

Gopal, S., *GIS and Spatial Analysis in Public Health and Epidemiology*, Caro Research , Concord MA, August 2006.

Gopal, S., and Kaufman, L. *Marine Integrated Decision Analysis System (MIDAS) for Monitoring and Analysis of Marine Management Areas*. NESTVAL, North East Geographers, October 2006, Burlington Vermont

Gopal, S., *Using geospatial modeling for conservation*. Ciudad Universitaria de Cantoblanco, Madrid, Spain, July 2007.

Patel, H., Gopal, S., and Kaufman, L. *Implementing a decision support system for marine management* , Annual Association of American Geographers, San Francisco, March 2007

Anderson, B., Gopal, S., and Kaufman, L. *Integrating and Modeling Ecological, Socio Economic, Governance factors in Marine Management - A case study of Belize*, Annual Association of American Geographers, San Francisco, March 2007.

Gopal, S., *MIDAS - Marine Integrated Decision Analysis System* at Marine Management Areas Meeting in San Francisco, Conservation International. October 2007 Invited lectures.

Gopal, S., *Intenational Workshop on Women, Science and Environment* (Jornada Internacional de la Mujer, la Ciencia, y el Medio Ambiente). Alicante, Spain.

Gopal, S. Participated in a documentary film called "*Minority Women in Science*" directed by Karin Koch, Cambridge Community TV. This film shown in Cambridge Science Festival in April 2007 followed by a discussion on the status of women scientists. Both these documentaries are featured on YouTube.

Gopal, S., and Kaufman, L. (2007). MIDAS - Marine Integrated Decision Analysis System at Marine Management Areas Meeting in San Francisco, October 2007.

Patel, Hrishi, Gopal, S., and Kaufman, L. (2007). Implementing a decision support system for marine management , Annual Association of American Geographers, San Francisco, March, 2007.

Gopal, S., and Kaufman, L. (2008). MIDAS - Marine Integrated Decision Analysis System for Marine Management Areas in Belize.- International Coral Reef Symposium Proceedings, Florida, 2008.

Gopal, S., (2009). MIDAS - A User Guide. Published by Conservation International (along with a CD). Conservation International, Washington DC.

R. Kaufmann and S. Gopal (2009) - Cartograms to show Carbon and other Emissions, Pardee Center project

Gopal (2009). Keynote address at GI-Forum 2009, Salzburg, Austria. Towards Geosocial Networking: Integrating Social Networks and LBS

Gopal, S. (along with Undergrad student David Kealey, Professor Petra Staufer-Steinnocher) (2009). Geographic Localization of IT Sector and Spillovers in India using Spatial Analytical Hierarchical Process (SAHP)". 56th Annual North American Meetings of the Regional Science Association, San Francisco, Nov 2009

Gopal, S. (along with Undergrad student David Kealey) (2009). Spatial Localization of Innovation in IT Sector in India - Vienna University of Economics and Business Administration, Vienna Austria, July 2009

Gopal, S., and Kaufman, L. (2010). EBM (Ecosystem Based Management) Webinar: Demonstration of MIDAS by Suchi Gopal and Les Kaufman of Boston University, Tuesday, (March 10, 2 pm US EST/11 am US PST). - Attracted International audience of over 300 people

Gopal, S., and Kaufman, L. (2010). MIDAS – A Spatial Decision Support System for Monitoring Marine Management, Date: June 29, 2010, Time: 5:00 pm, Institut für Wirtschaftsgeographie und Geoinformatik, WU Wien, Nordbergstr. Austria

Gopal, S., and Kaufman, L. (2010). Marine Spatial Management in Belize S2A Symposium in Belize City January 2010 and three workshops Belize - Punta Gorda, Bel Mopan, and Belize City in June 2010.

Lucy Hutyra, Mark Friedl, Sucharita Gopal, and Jared Newell (2011). The carbon metabolism of Boston - 26th Annual Landscape Ecology Symposium Sustainability in Dynamic Landscapes Portland, Oregon / April 3 - 7, 2011

Nathan Phillips, Mark Friedl, Suchi Gopal, Robert Kaufmann, The carbon metabolism of Boston, 26th Annual Landscape Ecology Symposium Sustainability in Dynamic Landscapes Portland, Oregon, April 3 - 7, 2011

Gopal, S., (along with Les Kaufman, Evan Goldman, Ben Carr, Marta Ribera) MIDAS – A Spatial Decision Support System for Monitoring Marine Management at the MOP Partners Meetings in Boston MA

Gopal, S., (along with Adil Najam) (2011). Connecting the Dots: Information Visualization and Text Analysis of the Searchlight Project Newsletters. Rockefeller's Searchlight Grantees India Immersion Event, Mumbai, India, April 4-8, 2011,

Gopal, S., (along with Josh Pitts, Les Kaufman, Evan Goldman, Ben Carr, Marta Ribera) MIMES-MIDAS – Dynamic modeling of tradeoffs to inform Marine Spatial Planning at The Regional Association for Research on the Gulf of Maine (RARGOM) - October 6, 2011.

Gopal, S., (2011). Talk on Time in Spatio-temporal processes and models - Seminar on Time at Boston University, organized by Professor Steve Grossberg, April 2011.

Valerie Pasquarella, Caroline Polger, Gopal, S., (2011). NSF GK12 Meetings in Washington DC - March 2011. Presented BU's GK12 outreach efforts to schools.

Suchi Gopal, (2012). Fuzzy Classification of the Urban-Rural Gradient of Metro Boston, Annual Meeting, Association of American Geographers, New York, New York. In session Coupled Socio-Ecological Systems in Urban Environments - Session 1 (organizers S. Gopal and A. Short).

Suchi Gopal, Benjamin Burkholder, Petra Stauer-Steinnocher, and Dominik Baier (2012). The Geography of China's Knowledge Networks and Patenting Activities Using EPO, JPO and USPTO Databases, Annual Meeting, Association of American Geographers, New York, New York.

Dominik Baier (WU Vienna), Benjamin Burkholder (Boston University), Suchi Gopal (Boston University) and Petra Stauer-Steinnocher (WU Vienna) (2012). Knowledge Networks and Patenting Activities in China: A Geospatial Analysis Using International Patent Systems Databases ERSA 2012 in Bratislava.

Davidson H. Hamer, Katherine Semrau, Lindsey L Everett, & Sucharita Gopal (2012). Emergency obstetrical and neonatal capacity and health center access in Kalomo District, Zambia. Abstract 53. 2nd Global Symposium on Health Systems Research, Beijing, China, November 1-3, 2012.

Pasquarella, V., Gopal, S., Landre, E., & Kaufman, L. "Modeling ecological processes within and beyond the boundaries of an urban conservation area." Student Conference on Conservation Science-New York. American Museum of Natural History, New York, NY. 11 Oct 2012. Oral Presentation.

Pasquarella, V., Gopal, S., Kaufman, L., Woodcock, C., & Zhu, Z. "Conservation in the Information Age: Harnessing the power of Landsat time series and natural history archives for research and management within and beyond the boundaries of Broadmoor." Mass Audubon Staff Natural History Conference. Drumlin Farms, Lincoln, MA. 20 Mar 2013. Oral Presentation.

### **Sponsored Research Activity (Current funding)**

Gopal, S. (PI). Title : NSF GK-12 Graduate STEM Fellows in K-12 Education GLACIER-Global Change Initiative-Education & Research (5 years) Agency : NSF - **GK12** Award Amount: **\$2.87M**  
NSF GK12 DGE-0947950

Kaufman, L (PI) and Gopal, S. (PI). A Landscape Analysis Partnership for Ecosystem Services in Lac Tonle Sap and the Lower Mekong Basin (PI). **McCarthy Foundation. 2012-2015, Amount: \$500,000**

### **Sponsored Research Activity (Pending)**

Sucharita Gopal, (PI), Curtis Woodcock, and Shashi Shekhar (2014). Collaborative Research: CyberSEES: Type 2 – Geonome: A spatio-temporal-spectral Landsat archive to monitor human sustainability. NSF - CYBER CEES (resubmitting April 2014). Requested Amount: \$797,412.00

Les Kaufman, (PI), Sucharita Gopal, Joe roman (UVM) (2014). Coastal SEES Collaborative Research: How key prey species patten ecosystem service production and tradeoffs in a coastal bank ecosystem, Stellwagen Bank Area (Gulf of Maine). Requested Amount: \$2.09M

### **Rejected Funding Proposals of 2012-2013**

Nathan Phillips and S. Gopal (co-PI), Coupled Natural and Human Systems proposal. CNH-Ex: Uncovering Hidden Interactions among Leaking Natural Gas Infrastructure, Green Infrastructure, and Communities. Requested Amount: \$ 231,997 (not funded)

Ellen Hines (PI), S. Gopal (co-PI), CNH: Developing an integrated framework to model resilience of the coupled human/natural environment in tropical and subtropical coastal systems. Requested Amount: \$ 1.47M (not funded)

Curtis Woodcock, Sucharita Gopal, and Les Kaufman (2013): Integrating Landsat time series, natural history archives, and citizen science for ecological forecasting and decision support: The future of land management and conservation in complex human-natural systems, NASA, Amount: \$350,000 (not funded)

S. Gopal (PI). Hurricane response and decision making based on crowdsourcing, CSAP NOAA grant, Amount \$80,000 (2013 – not funded). 2013.

### **Research Activity (past funded)**

*POWRE: Artificial Neural Networks for aggregation and disaggregation problems* PI: S. Gopal Agency: NSF-POWRE Amount: \$73,640 Period: 07/01/99 to 12/31/00

*Artificial Neural Networks Using Multi-Scale and Multi-Resolution Data,* PI: S. Gopal and S. Openshaw. Agency: NCGIA's Varenus Seed Grant Proposal Amount: \$3000 Period: 10/01/98 to 12/31/98

*Interactive network-based instructional tools for enhanced teaching and learning in remote sensing and GIS* PI: D. Dye Co-PI: S. Gopal Agency: BU Information Technology Grant Program Amount: \$12,282 Period: 03/01/99 to 02/28/00

*Impact of global climate change on US agriculture.* NSF: SBR-9523600, R. Kauffman, Principal Investigator, S. Gopal and L. Scuderi, Co-Principal Investigators. \$155,623 9/1/95 to 8/31/98.

*Center for Excellence in Remote Sensing at Boston University*, NASA, C. Woodcock, Principal Investigator, F. El-Baz, C. Cleveland, M. Friedl, S. Gopal, R. Kaufmann, J. Key, D. Dye, R. Myneni, G. Salvucci, and A. Strahler, Co-Principal Investigators. \$444,310, 10/01/97-08/31/00.

*Assessment of landuse and land cover change using remote sensing and artificial neural networks*, NSF: SBR9513889, S. Gopal, Principal Investigator, C. Woodcock, Co-Principal Investigator. \$192,516 08/01/96 to 07/30/99.

*POWRE: Artificial Neural Networks for aggregation and disaggregation problems*, NSF-POWRE, S. Gopal, Principal Investigator. \$73,640, 07/01/99 to 12/31/00.

*A Multiscale framework for spatial modeling in Geography*, NSF: SBR9513889, E. Kolaczyk, Principal Investigator. S. Gopal, Co-Principal Investigator. \$373,923, 07/01/00-08/31/03.

*Spatial determinants of insectivorous bat diversity – Patterns and process in paleotropical rain forest*. NSF: SBR9513889, PIs: S. Gopal, T. Kuntz, T. Kingston. – NSF \$380,151, 07/01/00-08/31/03.

*Complexity of Spatial and Categorical Scale in Landcover Characterization: A Statistical and Computational Framework*. E. Kolaczyk (PI), and S. Gopal (co-PI) NSF - BCS-0318209. \$535,914.00 08/01/03 - 07/31/06

*Spatial Modeling for Marine Management*. Conservation International S. Gopal (PI), 07/01.2006 – 4/1/2007. \$19000.

Gopal., S. (2009-2010). Marine Management Areas - Global Management Effectiveness: Phase 2 Conservation International. Amount : \$73,962.

*Ecosystem Service Modeling, Valuation, and Tradeoff Analyses in Support of Integrated Multi-Use Ocean Management in Massachusetts*. Gopal., S. (co-PI - 2009-2010). CELEST (Center of excellence for learning. PI: Stephen Grossberg NSF, Amount : \$5,000,000 (over 5 years and many institutional partners).

*Marine Spatial Planning in Massachusetts*, Gopal., S. (co-PI - 2012-2015). (PI: Les Kaufman) Mass Ocean Partnership (MOP). Amount: \$300,000.00

*Searchlight: Visualization and Analysis of Trend Data*. Gopal., S. (PI - 2011-2012). (grant to Pardee Center). Rockefeller Foundation. Amount: \$98,000.00

## **Graduate Student Advising**

### **First Reader for the following Masters/Ph.D. Students:**

- Abuelgasim (Ph.D. 1996), William Albert (Ph.D. 1997), Wigeo Liu (Ph.D. 2001), Tom Harrington (Ph.D. 2001), Junchang Ju (Ph.D. 2003), Tom Lomaglio (Ph.D.), Valerie Pasquarella(Ph.D.), Marta Ribera (Ph.D.), Xiojing Tang (Ph.D.).
- Yvonne Federowicz (MA, 1999), Sara Kunstrom (MA, 2000), Mark McGuire (MA), Asuka Imai (MA, 2000), Matt Adams (2006), Tim Costa (MA 2006), Hrish Patel (MA, current), Asnake Yeshiwondim (MA 2009), Ben Burkholder (current) and Jason Stern (current), Aya Maruyama (2013).

### **Second or Third Reader for the following Ph.D. Students:**

- Karen Seto (Geography), Seth Snell (Geography), Doug McKiver (Geography), Aaron Moody (Geography), Yecheng Wu (Geography), Maria del Carmen Vera Diaz (Geography), Jingyun Wang (Geography), Margaret Hendrick (Current), Rachel Nalepa (Current),

- Tigga Kingston (Biology), Siegfried Martens (Cognitive and Neural Systems), Wu (Psychology), Mary Louie (Statistics), Suhas Chelian (Cognitive and Neural Systems), Arun Ravindran (Cognitive and Neural Systems), Burton Schank (Biology), Elizabeth Jones (Biology), Ben Carr (Biology- Current), Nate Rycroft (Biology, Current), Dara Chan (Sargent School of Allied Health Services, Current).

**Post-Doctoral Student Advising**

Dr. Tigga Kingston (2003-2006) Dr. Junchang Ju (2004-2006),

**Undergraduate Advisor – Work For Distinction:**

Greg Unis, Meara Culligan, Ari Krichiver, Jennifer Ahlen, Ben Anderson, Chris Holden, (2010)  
Courtney Zambory (2013)

**Undergraduate Advisor – UROP and REU students:**

Recruited and advised many students here

**Courses taught at Boston University**

GIS Introductory and Advanced Levels (GG365, GE 505, and GE 805), World Regional Geography (GG 201), Multivariate Statistics (GG 516), Natural Hazards (GE 385), Economic Geography (GE 103), Environmental Decision-Making (GE 8xx), and Behavioral Geography (GE102).

**Reviewer - Journals**

Geographical Analysis, Geographical Systems, Photogrammetric Engineering and Remote Sensing, Remote Sensing of the Environment, Intelligent Systems, IEEE Transactions on Geoscience and Remote Sensing, IEEE Neural Networks, Transactions in GIS, Environment and Planning A, IEEE Data Mining and Intelligence.

**Reviewer – Funding Agencies**

NSF – Small Business (SBIR), EPA STAR, NASA, NSF, NIH