

Gregory J. Carbone
Curriculum Vitae
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Department of Geography
University of South Carolina
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Education

- PhD University of Wisconsin, Madison, WI, 1990, Geography.
Dissertation: "Implications of Using Spatially-Averaged Data in Crop-Weather and Climate Change Impact Studies." Advisor: James E. Burt
- MA University of Kansas, Lawrence, KS, 1984, Geography.
Thesis: "The Occurrence and Persistence of Wet and Dry Periods in the Eastern Great Plains." Advisor: Glen A. Marotz
- BA Clark University, Worcester, MA, 1982, Geography.
Honors Thesis: "An Empirical Study of the Urban Heat Island in Worcester, Massachusetts." Advisor: Sharon E. Nicholson

Professional Experience

- Professor, 2009–present (Chair, 2010–2013), University of South Carolina, Department of Geography.
- Associate Professor, 1996–2009, University of South Carolina, Department of Geography.
- Instructor/ Assistant Professor, 1989–1996, University of South Carolina, Department of Geography.
- Research and Teaching Assistant, 1984–1989, University of Wisconsin, Department of Geography.
- Teaching Assistant, 1982–1984, University of Kansas, Department of Geography and Meteorology.
- Research Assistant, 1981–1982, Clark University, Department of Geography.

Awards

- Michael J. Mungo Undergraduate Teaching Award, University of South Carolina, April 2005.

- Mortar Board Excellence in Teaching Award, University of South Carolina, December 2012.

Research Interests

- Climatic Variability and Change
- Climate Impacts on Agriculture and Water Resources

Refereed Journal Articles

Carbone, G.J., J. Fleming, K. Ellis, and G. Espinosa. 2023. Lessons learned from incorporating climate considerations in the Three Rivers Watershed-Based Plan. *Journal of South Carolina Water Resources* 9(1): 51-60.

Moraglia, G., E. Brattich, and G.J. Carbone. 2022. Precipitation trends in North and South Carolina, USA. *Journal of Hydrology Regional Studies* 44: 101201. <https://doi.org/10.1016/j.ejrh.2022.101201>

Lu, J., G.J. Carbone, X. Huang, K. Lackstrom, and P. Gao. 2020. Mapping the sensitivity of agriculture to drought and estimating the effects of irrigation on the sensitivity in the United States, 1950-2016. *Agricultural and Forest Meteorology*, 292-293, 108124. DOI: 10.1016/j.agrformet.2020.108124.

Hung, C.-L. J., L. A. James, G. J. Carbone, and J. M. Williams. 2020. Impacts of Combined Land-use and Climate Change on Streamflow in Two Nested Catchments in the Southeastern United States. *Ecological Engineering*, 143, 105665. <https://doi.org/10.1016/j.ecoleng.2019.105665>.

Houser, C., G. Carbone, C. Lafon, Y. Li, and J. Mossa. 2020. Building on the legacy of Carol Harden. *Physical Geography* 41:1, 1-2, DOI: [10.1080/02723646.2020.1715623](https://doi.org/10.1080/02723646.2020.1715623)

Lu, J., G.J. Carbone, and J. Grego. 2019. Uncertainty and hotspots in 21st century projections of agricultural drought from CMIP5 models. *Scientific Reports* 9, Article number: 4922.

Lu, J., G.J. Carbone, and P. Gao. 2019. Mapping the agricultural drought based on the long-term AVHRR NDVI and North American Regional Reanalysis (NARR) in the United States, 1981-2013. *Applied Geography* 104: 10–20.

Gao, P., G.J. Carbone, and J. Lu. 2018. Flood simulation in South Carolina watersheds using different precipitation inputs. *Advances in Meteorology*. Article ID 4085463.

Hung, C.-L., L.A. James, and G.J. Carbone. 2018. Impacts of urbanization on stormflow magnitudes in small catchments in the Sandhills of South Carolina, USA. *Anthropocene* 23: 17–28.

Carbone, G.J., J. Lu, and M. Brunetti. 2018. Estimating uncertainty associated with the standard precipitation index. *International Journal of Climatology*. DOI: 10.1002/joc.5393

Gao, P., G.J. Carbone, J. Lu, and D. Guo. 2017. An Area-Based Approach for Estimating Extreme Precipitation Probability. *Geographical Analysis* doi:10.1111/gean.12148

Samadi, S., D.L. Tufford, and G.J. Carbone. 2017. Assessing parameter uncertainty of a semi-distributed hydrology model for a shallow aquifer dominated environmental system. *Journal of the American Water Resources Association* 53(6): 1368–1389.
<https://doi.org/10.1111/1752-1688.12596>

Samadi, S., D.L. Tufford, and G.J. Carbone. 2017. Estimating Hydrologic Model Uncertainty in the Presence of Complex Residual Error Structures. *Stochastic Environmental Research and Risk Assessment* <https://doi.org/10.1007/s00477-017-1489-6>

Lu, J., G.J. Carbone, and P. Gao. 2017. Detrending crop yield data for spatial visualization of drought impacts in the United States, 1895–2014. *Agricultural and Forest Meteorology*, 237–238, 196–208. DOI: <http://dx.doi.org/10.1016/j.agrformet.2017.02.001>

Li, Z., Q. Huang, G.J. Carbone, and F. Hu. 2016. A High Performance Query Analytical Framework for Supporting Data-intensive Climate Studies. *Computers, Environment and Urban Systems* 62: 210–221. DOI: 10.1016/j.compenvurbsys.2016.12.003.

Lackstrom, K., G.J. Carbone, D.J. Tufford, and A. Patel. 2016. Climate and water resources in the Carolinas: Approaches to applying global climate change information to local decisions. *Journal of South Carolina Water Resources* 3(1): 49–61.

Gao, P., G.J. Carbone, and D. Guo. 2015. Assessment of NARCCAP Model in Simulating Rainfall Extremes Using a Spatially Constrained Regionalization Method. *International Journal of Climatology* doi: 10.1002/joc.4500

Kabela, E.D., and Carbone, G.J. 2015. NARCCAP Model Skill and Bias for the Southeast United States. *American Journal of Climate Change* 4, 94–114.

Carbone, G.J. 2014. Managing climate change scenarios for societal impact studies. *Physical Geography* 35(1): 22–49.

- Samadi, S., G.J. Carbone, M. Mahdavi, F. Sharifi, M.R. Bihamta. 2013. Statistical downscaling of river runoff in a semi-arid catchment. *Water Resources Management* 27: 117-136.
- Rhee, J., and G.J. Carbone. 2011. Estimating drought conditions for regions with limited precipitation data. *Journal of Applied Meteorology and Climatology* 50: 548-559. doi: 10.1175/2010JAMC2604.1
- Rhee, J., J. Im, and G.J. Carbone. 2010. Monitoring agricultural drought for arid and humid regions using the multi-sensor remote sensing data. *Remote Sensing of Environment* 114: 2875-2887. doi: 10.1016/j.rse.2010.07.005.
- Dow, K., R.L. Murphy, and G.J. Carbone, 2009. Consideration of User Needs and Spatial Accuracy in Drought Mapping. *Journal of the American Water Resources Association* 45(1):187-197. DOI: 10.1111/j.1752-1688.2008.00270.x
- Hwang, Y., and G.J. Carbone. 2009. Ensemble forecast of drought indices using a modified K-NN technique. *Journal of Applied Meteorology and Climatology* 48(7): 1289-1301.
- Rhee, J., J. Im, G.J. Carbone, and J.R. Jensen. 2008. Delineation of climate regions using in-situ and remotely-sensed data for the Carolinas. *Remote Sensing of Environment* 112(6): 3099-3111. DOI: 10.1016/j.rse.2008.03.001.
- Rhee, J., G.J. Carbone, and J. Hussey. 2008. Drought index mapping at different spatial units. *Journal of Hydrometeorology* DOI: 10.1175/2008JHM983.1.
- Carbone, G.J., J. Rhee, H. Mizzell, and R. Boyles. 2008. A regional-scale drought monitor for the Carolinas. *Bulletin of the American Meteorological Society* 89: 20-28. DOI: 10.1175/BAMS-89-1-20.
- Rhee, J., and G.J. Carbone. 2007. A comparison of weekly monitoring methods of the Palmer Drought Index. *Journal of Climate* 20: 6033-6044. DOI: [10.1175/2007JCL1693.1](https://doi.org/10.1175/2007JCL1693.1)
- Dow, K., and G.J. Carbone. 2007. Climate science and decision making. *Geography Compass* 1: 10.1111/j.17498198.2007.00036.x
- Dow, K., R.E. O'Connor, B. Yarnal, G.J. Carbone, and C.L. Jocoy. 2007. Why worry? Community water system managers' perceptions of vulnerability. *Global Environmental Change* 17: 228-237.

- Yow, D.M., and G.J. Carbone. 2006. The urban heat island and local temperature variations in Orlando, Florida. *Southeastern Geographer* 46(2): 117-141.
- O'Connor, R.E., B. Yarnal, K. Dow, C.L. Jocoy, and G.J. Carbone. 2005. "Feeling at-risk matters: Water managers and the decision to use forecasts." *Risk Analysis* 25(5): 1265-1275.
- Carbone, G.J., and K. Dow. 2005. "Water resource management and drought forecasts in South Carolina." *Journal of the American Water Resources Association* 41(1): 145-155.
- Carbone, G., and H. Power. 2005. "Integrating campus meteorological data in environmental courses." *Journal of Geography* 104(1): 3-8.
- Mearns, L.O., G. Carbone, R.M. Doherty, E. Tsvetsinskaya, B.A. McCarl, R.M. Adams, and L. McDaniel. 2003. "The uncertainty due to spatial scale of climate scenarios in integrated assessments: An example from U.S. agriculture." *Integrated Assessment* 4(4): 225-235.
- Carbone, G.J., W. Kiechle, C. Locke, L. Mearns, L. McDaniel, and M. Downton. 2003. "Response of soybeans and sorghum to varying spatial scales of climate change scenarios in the southeastern United States." [Climatic Change 60\(1-2\): 73-98.](#)
- Carbone, G.J., L.O. Mearns, T. Mavromatis, E.J. Sadler, and D. Stooksbury. 2003. "Evaluating CROPGRO-Soybean performance for use in climate impact studies." *Agronomy Journal* 95: 537-544.
- Schwartz, M.D., G.J. Carbone, G.L. Reighard, and W.R. Okie. 1997. "A model to predict peach phenology and maturity using meteorological variables." *HortScience* 32(2): 213-216.
- Carbone, G.J., S. Narumalani, and M. King. 1996. "Application of remote sensing and GIS technologies with physiological crop models." *Photogrammetric Engineering and Remote Sensing* 62(2): 171-179.
- Carbone, G.J., and P.D. Bramante. 1995. "Translating monthly temperature from regional to local scale in the southeastern United States." *Climate Research* 5(3): 229-242.
- Carbone, G.J., and M.W. Burdett. 1995. "Long-term winter temperature trends in the southeastern United States." *Southeastern Geographer* 35(2): 167-181.
- Lloyd, R.E., and G.J. Carbone. 1995. "Comparing human and neural network learning of climate categories." *The Professional Geographer* 47(3): 237-250.

Carbone, G.J. 1995. "Issues of spatial and temporal variability in climate impacts studies." *The Professional Geographer* 47(1): 30–40.

Carbone, G.J., and M.D. Schwartz. 1993. "Potential impact of winter temperature increases on South Carolina peach production." *Climate Research* 2: 225–233.

Carbone, G.J. 1993. "Considerations of meteorological time series in estimating regional-scale crop yield." *Journal of Climate* 6(8): 1607–1615.

Carbone, G.J., and L.A. James. 1993. "Applying GIS technology to climate data in South Carolina." *Geo Info Systems* 3(9): 52–59.

Book Chapters

Carbone, G.J., A. DeGaetano, K. Dow, J. Fowler, G. Garfin, H. Hartmann, E. Lay, and J. Rhee. 2016. Challenges, pitfalls, and lessons learned in developing a decision-support tool. In *Climate in Context* Parris, A.S., G. Garfin, K. Dow, R. Meyer, and S.L. Close eds. American Geophysical Union, Wiley and Sons.

Carbone, G.J., and J. Hidore. 2008. Climate, Vegetation, and Soils. In: *A Geography of the Carolinas*, Bennett, D.G., and J.C. Patton eds., pp. 35–51, Parkway Publishers.

Carbone, G.J., W. Kiechle, C. Locke, L.O. Mearns, L. McDaniel, and M.W. Downton. 2003. "Response of soybean and sorghum to varying spatial scales of climate change scenarios in the southeastern United States." In: *Issues in the impacts of climate variability and change on agriculture: Applications to the southeastern United States*, Mearns, L.O. (ed.), pp. 73–98.

Beidel, K., G.J. Carbone, and P. Gilmartin. 1996. "Low Country Miasmas: Perceptions of the Early Settlers." In *Snapshots of the Carolinas: Landscapes and Cultures*, G. Bennett (ed.), pp. 7–10.

Laboratory Manual

Carbone, G.J. 2016. *Exercises for Weather and Climate. 9th ed.*, Englewood Cliffs, NJ: Pearson Education. 244 pp.

Carbone, G.J. 2013. *Exercises for Weather and Climate. 8th ed.* Englewood Cliffs, NJ: Prentice Hall. 226 pp.

Carbone, G.J. 2010. *Exercises for Weather and Climate*. 7th ed. Englewood Cliffs, NJ: Prentice Hall. 210 pp.

Carbone, G.J. 2007. *Exercises for Weather and Climate*. 6th ed. Englewood Cliffs, NJ: Prentice Hall. 204 pp.

Carbone, G.J. 2004. *Exercises for Weather and Climate*. 5th ed. Englewood Cliffs, NJ: Prentice Hall. 200 pp.

Carbone, G.J. 2001. *Exercises for Weather and Climate*. 4th ed. Englewood Cliffs, NJ: Prentice Hall. 244 pp.

Carbone, G.J. 1997. *The Atmosphere: Laboratory Manual with IBM Disk*. 3rd ed. Englewood Cliffs, NJ: Prentice Hall. 250 pp.

Carbone, G.J. 1994. *The Atmosphere: Laboratory Manual with IBM Disk*. Englewood Cliffs, NJ: Prentice Hall. 228 pp.

Carbone, G.J. 1992. *The Atmosphere: An Introductory Weather and Climate Laboratory Manual*. Englewood Cliffs, NJ: Prentice Hall. 189 pp.

Reports and Proceedings, and Other Publications

Mizzell, H.P., and G.J. Carbone. 2005. "Strategies for mitigating drought: An evaluation of state and local drought triggers" *Preprints, Applied Climate Conference, American Meteorological Society*, June 2005, Savannah, GA.

Yarnal, B., R. O'Connor, K. Dow, G. Carbone, and C.L. Jocoy. 2005. "Why don't resource managers use weather and climate forecasts?" *Preprints, Applied Climate Conference, American Meteorological Society*, June 2005, Savannah, GA.

Beesley, B., G. Carbone, E.J. Sadler, D. Evans, J. Millen, and C. Camp. "Using Satellite Imagery to Detect Spatial Variability in Corn." in *Proceedings of the Fourth International Precision Agriculture Conference*, Berlin, 16 June 2003.

Carbone, G. "Interactive Computer Modules to Accompany *Understanding Weather and Climate*." 2001. Aguado, E., and Burt, J.E. Prentice Hall.

Locke, C., G. Carbone, T. Filippi, B. Kiechle, J. Rainman, J. Sadler, B. Gerwig, and Dean Evans. 2000. "Using remote sensing and modeling to measure crop biophysical variability." 16 pp. in: Robert, P.C., Rust, R.H., and Larson, W.E., *Proceedings of the*

Fifth International Precision Agriculture Conference, ASA, CSSA, and SSS, Madison, WI.

Carbone, G.J., and D.M. Yow. 2000. "Orlando, Florida's urban heat island" *Preprints, 10th Conference on Satellite Meteorology and Oceanography, American Meteorological Society, 80th Annual Meeting, January 2000, Long Beach, CA* 469–470.

Mearns, L.O., G.J. Carbone, W. Gao, L. McDaniel, E. Tsvetsinskaya, B. McCarl, and R. Adams. 2000. "The issue of spatial scale in integrated assessments: an example of agriculture in the southeastern U.S." *Preprints, 11th Symposium on Global Change Studies, American Meteorological Society, 80th Annual Meeting, January 2000, Long Beach, CA.*

Carbone, G., M. Brown, and D. Yow. 2000. Climatology Chapter in: *Characterization of the Ashepoo–Combahee–Edisto (ACE) Basin, South Carolina CD-ROM*. South Carolina Department of Natural Resources and the National Oceanic and Atmospheric Administration, Coastal Services Center. SC Marine Resources Center Special Report Number 17. NOAA/CSC/20010-CD. Charleston, SC: NOAA Coastal Services Center.

Carbone, G.J., S.E. Baker, and D.J. Smith. 1994. Establishment of a Prototype GIS to Integrate Topographic, Hydrologic, and Climatic Data with WSR-88D Precipitation Data. UCAR/COMET Report.

Narumalani, S., and G.J. Carbone. 1993. "The Use of Remote Sensing for Crop Simulation Studies." *ASPRS/ASCM Annual Convention and Exposition Technical Paper Vol. II*, pp. 230–239.

Carbone, G.J. 1993. "Peaches and Climate Change." *Southeastern Climate Review*. 3(3): 3–17.

Carbone, G.J., and S. Narumalani. 1992. *The Use of Remote Sensing and GIS with Physiological Crop Models*. Research Paper # 101592 Southeast Regional Climate Center.

Carbone, G.J., and M.D. Schwartz. 1992. *Vulnerability of Peaches to Winter Temperature Increases*. Research Paper # 100192 Southeast Regional Climate Center.

Carbone, G.J., P.R. Holt, and L.A. James. 1991. "Application of GIS Technology to Climate Studies in the Carolinas." *Proceedings of the GIS/LIS 1991 Annual Conference and Exposition*.

Carbone, G.J., L.A. James, Y. Cheng, P. Holt, and H. Lin. 1991. *Carolina Climatic and Hydrologic Data Spatial Analysis System: User's Guide*. Research Paper # 121091 Southeast Regional Climate Center.

Carbone, G.J., and L.A. James. 1991. *Use of a Geographic Information System in Climate Analysis*. Research Paper # 121191 Report on Research conducted for the Southeast Regional Climate Center.

Carbone, G.J. 1990. "Measuring Agricultural Response to Climatic Variability and Change." Proceedings of the Agronomy Society of America, Crop Science Society of America, and Soil Science Society of America, 23 Oct. 1990.

Carbone, G.J. 1990. "The Use of Weather and Climate Data in the Introductory Meteorology Curriculum." *Proceedings of the South Carolina Academy of Sciences*, March 1990.

Carbone, G.J. 1989. "Instructive Uses of a One-Dimensional Energy Balance Model." *Proceedings of the IBM Academic Computing Conference, Anaheim, CA, July 1989*.

Book Reviews

Carbone, G.J. 2004. "Florida Weather, 2nd edition by Morton D. Winsberg." *Southeastern Geographer* 44(2): 291-292.

Carbone, G.J. 1990. "Florida Weather by Morton D. Winsberg." *Southeastern Geographer* 30(2): 143-145.

Grants

Dow, K., G.J. Carbone, L. Fly, C.E. Konrad, and K. Lackstrom. "Building Adaptive Capacity in the Carolinas: The Carolinas Integrated Sciences & Assessments (CISA) Program." NOAA. \$3,754,976, 2016-2021.

Fly, L., R. Devoe, K. Dow, G. Carbone. "Subcontract to Building Community Resilience to Water-Related Hazards in the Charleston, SC, Resilience Network Initiative," NOAA-NOS, \$510,319 total (\$85,975 USC portion), 2016-2018.

Dow, K., G.J. Carbone, C.E. Konrad, D. Tufford, J. Whitehead. "Carolinas Integrated Sciences and Assessments." NOAA. \$3,752,037, 2011-2016.

Whitehead, J., D. Tufford, K. Dow, and G. Carbone, "Assessing the Impact of Salt-Water Intrusion in the Carolinas under Future Climatic and Sea-Level Conditions." NOAA, Sectoral Applications Research Program (SARP), \$235,717, 2008-2010.

Carbone, G.J., A. DeGaetano, K. Dow, H. Mizzell, and J. Rhee, "Implementation of a drought mapping tool in the eastern United States." NOAA Transition of Research Applications to Climate Services (TRACS), \$249,570, 2008–2010.

Carbone, G., K. Dow, D. Tufford, H. Mizzell, and A.W. Badr. "Integrating Climate Science and Water Management in North and South Carolina." NOAA, \$1,122,425, 2006–2011.

Devoe, R., G. Carbone, R. Bacon, J. Thigpen, D. Tufford, K. Dow, and W. Clark. "The Carolinas Coastal Climate Outreach Initiative." NOAA/Sea Grant, \$300,000, 2007–2010.

Carbone, G., K. Dow, M. Janis, K. Karwan, D. Tufford, and H. Mizzell. "Integrating Climate Science and Water Management in North and South Carolina." NOAA, \$408,045, 2003–2006.

Ekanem, E.M., G. Carbone, E. Carr, and K. Dow. "Societal pressures on groundwater resources in southeastern Nigeria." International Geosphere Biosphere Programme, International Human Dimensions Programme, World Climate Research Programme. \$19,128, 2004–2005.

Yarnal, B., K. Dow, R. Bord, G. Carbone, S. Cutter, and R. O'Conner. "Decision making and long-range climate forecasts: A case study in water resource management." NOAA, \$316,519, 1999–2003.

Carbone, G., and H. Power, "Integrating campus meteorological and air quality data in environmental courses." Sustainable Universities Initiative, \$3,000, 2002–2003.

Carbone, G. "Atmospheric teleconnection patterns' influence on climate and weather in the southeastern United States." Southeast Regional Climate Center, \$12,387, 2001–2002.

Carbone, G. "Atmospheric teleconnection patterns' influence on climate and weather in the southeastern United States." Southeast Regional Climate Center, \$15,291, 2000–2001.

Mearns, L.O., R. Katz, S. Thompson, W. Easterling, G. Carbone, R. Adams, B. McCarl, "Sensitivity analysis of the effects of changes in mean and variability of climate on crop production and regional economics in the southeastern United States: An integration of stochastic, climate, crop and economic modeling." Environmental Protection Agency, \$1,783,569, (Carbone/USC share: \$103,930), 1996–2000.

Mearns, L.O., R. Katz, G. Carbone, W. Easterling, D. Rundquist, and B. Walter-Shea, "Analysis of the effect of changing climate variability on crop production in the Southeast: An Integration of Stochastic Modeling, Regional Climate Modeling, Crop

Modeling and Remote Sensing." NASA, \$1,066,878, (Carbone/USC share: \$167,386), 1997–2001.

Carbone, G.J., and D. Yow. "Calibrating NOAA AVHRR's Thermal Band." SERCC, \$17,353, 1999–2000.

Carbone, G.J., and D. Yow, "Orlando Florida's Urban Heat Island." SERCC, \$9,537, 2000.

Carbone, G.J. "Investigating the impacts of climate variability on agricultural systems." USDA. \$51,651, 1998–1999.

McKellar, H.N., L.A. James, and G.J. Carbone, "Heavy Metals in sediments of the Mill Creek and Colonels Creek Watersheds." SC National Guard, \$30,000, 1996–1997.

McKellar, H.N., L.A. James, and G.J. Carbone, "Rainfall-runoff Relationships in the Colonels Creek Watershed." SC DHEC, \$121,756, 1997–1999.

Dean, J.M., H.N. McKellar Jr., G.J. Carbone, and L.A. James. "Ecological Processes and Hydrology of a Sandhills Watershed." South Carolina Department of Health and Environmental Control, \$104,515, 1996–1997.

Carbone, G.J., M. Cammarata, and T. Ardrey, "Development of a GIS Database for High-Risk Dams in South Carolina." 1 October 1995–30 September 1996. Research Grant funded by the University Corporation for Atmospheric Research (UCAR), \$5,123.

Carbone, G.J., M.D. Schwartz, and G.L. Reighard, "Development of a Phenological Model to Predict Peach Maturity from Meteorological Variables." 1 June 1994–31 May 1996. Research Grant funded by Southeast Regional Climate Center, \$85,308.

Carbone, G.J., S. Baker, and D.J. Smith, "Establishment of a Prototype GIS to Integrate Topographic, Hydrologic, and Climatic Data with WSR-88D Precipitation Data in the Edisto River Basin." 1 December 1993–31 November 1994. Research Grant funded by the University Corporation for Atmospheric Research (UCAR), \$6,970.

Carbone, G.J., "Regional-Scale Agricultural Impacts." 15 June–15 August, 1994. Research Grant funded by the South Carolina Water Resources Commission, \$1,500.

Carbone, G.J., "Implementation of Computer Technologies in Meteorologic Instruction." Summer 1993, Instructional Development Grant funded by the University of South Carolina, \$1,000.

Carbone, G.J., "Climate Impacts on Agriculture in South Carolina." Summer 1992, Research Grant funded by the Southeast Regional Climate Center, \$3,500.

Carbone, G.J., "Improvement in Meteorology Laboratory Instruction." July 1990–May 1991, Instructional Innovation Grant funded by the Provost's Office, University of South Carolina, \$2,947.

Carbone, G.J., and L.A. James, "A GIS Database and Mapping Framework for Climate Analysis in the Southeastern United States." 1 July 1990–30 June 1991, Research grant funded by the Southeast Regional Climate Center, \$41,238.

Carbone, G.J., "Implementation of Crop Yield Models for the Southeast Region." 15 May–1 September 1990. Research Grant funded by the South Carolina Water Resources Commission, \$3,500.

Carbone, G.J., "A Physically-based Water Balance Model to Evaluate Drought in South Carolina." October 1989–June 1990, Research and Productive Scholarship Grant funded by the University of South Carolina, \$2,190.

Conference Presentations

Patel, A., and G.J. Carbone. "Producing Contextual Climate Change Information for Strategic Water Supply Planning." Poster presented at Annual Meeting of the American Association of Geographers, Boston, MA, 7 April 2017.

Carbone, G.J., J. Lu, and M. Brunetti. "Estimating Confidence Intervals Associated with the Standardized Precipitation Index." Poster presented at Annual Meeting of the American Association of Geographers, Boston, MA, 7 April 2017.

Carbone, G.J., K. Beidel, J. Lu, P. Gao. "A hydroclimate extremes atlas for the Carolinas." Paper presented at the 19th Annual Conference of the NC Water Resources Research Institute, Raleigh, NC, 15 March 2017.

Carbone, G.J. "A hydroclimate extremes atlas for the Carolinas." South Carolina Water Resources Conference, Columbia, SC, 13 October 2016.

Lu, J., G.J. Carbone, P. Gao. "Long-Term Agriculture Drought Monitoring Using AVHRR NDVI and North American Regional Reanalysis from 1981 to 2013 in United States," Association of American Geographers Annual Meeting, San Francisco, CA, 2 April 2016.

Gao, P., G.J. Carbone, and J. Lu. "The influence and implications of a single extreme event on intensity-duration-frequency (IDF) curves in South Carolina. Geological Society of America, Southeastern Section-65th Annual Meeting, Columbia, SC, 1 April 2016.

Carbone, G.J., P. Gao, and J. Lu. "The Influence and Implications of a Single Extreme Event on Intensity-Duration-Frequency (IDF) Curves in South Carolina," Association of American Geographers Annual Meeting, San Francisco, CA, 30 March 2016.

Gao, P., and G.J. Carbone, "NARCCAP Model Comparison of Extreme Rainfall Intensity in the Continental United States," Annual Meeting of the Association of American Geographers, Chicago, IL, 24 April, 2015.

Lu, J., and G.J. Carbone. "Understanding the Impact of Drought on Crop Yield in South and North Carolina," Annual Meeting of the Association of American Geographers, Chicago, IL, 21 April, 2015.

Samadi, S, D.L. Tufford, and G.J. Carbone. "Improving the robustness of uncertainty algorithms in quantification of uncertainty in water balance forecasting," South Carolina Water Resources Conference, Columbia, SC, 16 October 2014

Samadi, S, D.L. Tufford, and G.J. Carbone. "Improving hydrologic predictions of a distributed watershed model via uncertainty quantification of evapotranspiration methods," South Carolina Water Resources Conference, Columbia, SC, 15 October 2014.

Gao, P., G. Carbone, and E. Kabela. "Comparison of Rainfall Intensity in Downscaled Climate Model Output for the Carolinas," Association of American Geographers, Annual Meeting, Tampa, FL, 10 April 2014.

Carbone, G.J. "Regional-scale drought measures for effective decision making," Asia-Pacific Economic Council Climate Symposium, Jakarta, Indonesia, 12 November 2013.

Gao, P., G. Carbone, D. Tufford, A. Patel, and L. Rouen. "Assessing methods to disaggregate daily precipitation for hydrological simulation." Association of American Geographers, Annual Meeting, Los Angeles, CA, 13 April 2013.

Kabela, E., and G. Carbone. "NARCCAP Model Validation for the Southeast United States," American Geophysical Union Annual Meeting, San Francisco, CA, 3 December 2012.

Gao, P., G. Carbone, D. Tufford, and L. Felker. "Assessing Methods to Disaggregate

Daily Precipitation for Hydrological Simulation,” South Carolina Water Resources Conference, Columbia, SC, 10 October 2012.

Patel, A., D. Tufford, P. Gao, and G. Carbone. “Assessing Climate Change Impacts on Streamflow in South Carolina River Basins.” South Carolina Water Resources Conference, Columbia, SC, 10 October 2012.

Carbone, G. “Improving the Characterization of Drought and Understating of Impacts on Water and Ecological Resources.” NOAA in the Carolinas Conference, Charleston, SC, 15 March 2012.

Carbone, G.J. “Downscaling climate change scenarios for salinity modeling.” Invited presentation at the Drought and Salinity Intrusion: Past, Present, and Future Conditions in the Coastal Yadkin–Pee Dee River Basin Workshop, 14 December 2011.

Whitehead, J.C., G. Carbone, K. Dow, D.L. Tufford, R.H. Bacon, and J.F. Thigpen III. “Using climate extension to support adaptation: The Carolinas Coastal Climate Outreach Initiative.” *American Meteorological Society, Applied Climate Conference*, Asheville, NC, 20 July 2011.

Rhee, J., J. Im, and G. Carbone. “Agricultural drought monitoring using multi-sensor remote sensing data.” *Association of American Geographers, Annual Meeting*, Seattle, WA, 14 April 2011.

Tufford, D.L., L. Felker, and G. Carbone. “Hydrologic and water quality modeling of the Yadkin Pee Dee and Waccamaw River watersheds.” *2011 Water Resources Research Initiative Annual Conference and North Carolina Water Resources Association Symposium*, Raleigh, NC, 22 March 2011.

Carbone, G., and E. Kabela. “Downscaling climate change information for water resources.” *Proceedings of the 2010 South Carolina Water Resources Conference*, held Columbia, SC, 13–14 October 2010. Available at http://www.clemson.edu/restoration/events/past_events/sc_water_resources/archives_2010/t1_2010_proceedings.html.

Carbone, G., J. Rhee, H. Mizzell, K. Dow, and A.T. DeGaetano. “Evolution of the dynamic drought index tool.” Presentation at the *90th Annual Meeting of the American Meteorological Society*, Atlanta, GA, 20 January 2010.

Mizzell, H., G. Carbone, K. Dow, and J. Rhee. “Addressing Monitoring Needs for Drought Management.” *Proceedings of the 2010 South Carolina Water Resources Conference*, Columbia, SC, 13–14 October 2010.

Carbone, G. "Climate Change and the Southeast United States and Caribbean" *Southeast and Caribbean Regional Team (SECART) Workshop*, Jacksonville, FL, 24 May 2010.

Carbone, G., K. Dow, H. Mizzell, and J. Rhee. "Evolution of a drought monitoring tool," *Eos Trans. AGU*, 89(53), Fall 2008 Meet. Suppl., Abstract A13D-0276.

Carbone, G. "A Dynamic Drought Tool for the Carolinas." *South Carolina Water Resources Conference*, Charleston, SC, 14–15 October 2008.

Carbone, G. "Taking the 'Voodoo' out of Science: Improving Stakeholder-Science Communications." *104th Annual Meeting of the Association of American Geographers*, Boston, MA, 16 April 2008.

Tufford, D.L., G. Carbone, J. Hussey, and K. Dow. "Impacts of climate anomalies on water resources in the Carolinas." *Climate Prediction Application Sciences Workshop*. Chapel Hill, NC, 4–7 March 2008.

Carbone, G. "Climate change and Southeast rivers." Invited presentation at *South Carolina Rivers Forum*, sponsored by the Center for Humans and Nature, and American Rivers, 18 March 2008, Columbia, SC.

Carbone, G.J. "Collaborative climate impacts work in the Carolinas." Invited presentation at the Shenandoah Valley Natural Systems Symposium, 15 October 2007.

Carbone, G.J. "Communicating climate information to resource managers." Invited presentation to the *National Research Council's Committee on Strategic Advice on the U.S. Climate Change Science Program*, Boulder, CO, 7 June 2007.

Rhee, J., J. Im, and G.J. Carbone. "Drought monitoring of South Carolina using MODIS and TRMM data." *American Society for Photogrammetry and Remote Sensing 2007 Annual Conference*, Tampa, FL, 7–11 May 2007.

Dow, K., R.L. Murphy, G. Carbone, and J. Rhee. "User Evaluation of Drought Mapping." *103rd Annual Meeting of the Association of American Geographers*, 21 April 2007.

Dunham, S., and G.J. Carbone. "A comparison of drought stage determination methods for South Carolina." *103rd Annual Meeting of the Association of American Geographers*, 18 April 2007.

Murphy, R.L., K. Dow, J. Rhee, and G. Carbone. "User Awareness of Uncertainty in an Online Mapping Tool: The Dynamic Drought Index for Basins in North and South Carolina." *103rd Annual Meeting of the Association of American Geographers*, 17 April 2007.

Rhee, J., G.J. Carbone, and J. Hussey. "Effect of Spatial and Temporal Resolutions on Drought Monitoring in the Carolinas." *103rd Annual Meeting of the Association of American Geographers*, 17 April 2007.

Carbone, G.J. "Climate services and user communities." Invited presentation at the National Climate Data Center, 12 April 2007.

Hwang, Y., and G. Carbone. "Ensemble Forecast of Monthly Drought Indices in South Carolina." *Climate Prediction Applications Science Workshop (CPASW)*, 21 March 2007.

Carbone, G.J. "A dynamic drought monitoring system." Presentation at the NOAA-RISA Principal Investigators Meeting, San Diego, CA, 27 February 2007.

Carbone, G.J. "Climate scenarios for coastal South Carolina and the Southeast region: What science tells us could happen in the next 100 years." Invited presentation at *The Nation's Coasts: A Vision and Action Agenda for the Future, Southeast Regional Meeting*, sponsored by The Heinz Center and The Center for Humans and Nature, Mepkin Abbey, SC, 5 December 2006.

Carbone, G.J. "Climate and decision making." Invited lecture in the School of Natural Resources, University of Nebraska, Lincoln, NE, 11 October 2006.

Carbone, G.J., J. Rhee, and H. Mizzell. "Drought monitoring in the Carolinas." Invited presentation at the *National Integrated Drought Information System (NIDIS) Implementation Plan Workshop*, Longmont, CO, 21 September 2006.

Carbone, G.J., J. Rhee, and H. Mizzell. "A drought decision-support for the Carolinas." Invited presentation to *NOAA's Climate Working Group Retreat*, Santa Fe, NM, 1 August 2006.

Dow, K., G.J. Carbone, K. Lackstrom, and D. Tufford, "Integrating Climate Science and Information with Environmental Management." *Colloquium for Colgate University, Department of Environmental Studies*, 7 April 2006.

Carbone, G.J., J. Rhee, H. Mizzell, K. Dow, and D. Tufford. "Deciding on drought triggers in the FERC dam relicensing process." *4th Annual NOAA Climate Prediction Applications Science Workshop: Research and Applications on Use and Impacts*. Tucson, AZ, 23 March 2006.

Carbone, G.J., and H. Mizzell. "A regional drought monitor for the Carolinas." *12th Annual Mini-Technical Conference, Palmetto Chapter of the American Meteorological Society*. Columbia, SC, 15 March 2006.

Rhee, J., G.J. Carbone, H. Mizzell, R. Boyles. "Development of web-based drought index maps using scalable vector graphics." *102nd Annual Meeting of the Association of American Geographers*, 10 March 2006.

Carbone, G.J. "Climate Change and Energy Issues." Invited lecture in *Lifelong Learning of Hilton Head Island Energy Series*, 18 February 2006.

K. Dow, G. Carbone, K. Lackstrom, and D. Tufford. "Vulnerability and Adaptation in Water Resources Management: Lessons for Greater Stakeholder-Scientist Collaboration." Colloquium for Kansas State University, Department of Geography, 27 January 2006.

Dow, K., G.J. Carbone, D. Tufford, H. Mizzell, J. Rhee, K. Lackstrom. "Improving Climate Information for Hydroelectric Dam Re-licensing (selected presentation)." *Climate Change Science Program Workshop*. Washington, DC, 14–16 November 2005.

Carbone, G.J., K. Dow, and D. Tufford. "Supply Side Management: Stakeholders and Climate Science." *Workshop on Science Policy Assessment and Research on Climate*. Honolulu, HI, 15–17 August 2005.

Dow, K., G.J. Carbone, and D. Tufford. "Demand Side and Climate Science for Decision Making." *Workshop on Science Policy Assessment and Research on Climate*. Honolulu, HI, 15–17 August 2005.

Carbone, G.J., K. Dow, and D. Tufford. "Reconciling Supply and Demand in Implementing a Research Agenda." *Workshop on Science Policy Assessment and Research on Climate*. Honolulu, HI, 15–17 August 2005.

Mizzell, H.P., and G.J. Carbone. "Strategies for mitigating drought: An evaluation of state and local drought triggers." *American Meteorological Society, Applied Climate Conference*, Savannah, GA, June 2005.

Yarnal, B., R. O'Connor, K. Dow, G. Carbone, and C.L. Jocoy. "Why don't resource managers use weather and climate forecasts?" *American Meteorological Society, Applied Climate Conference*, Savannah, GA, June 2005.

Carbone, G., K. Dow, D. Tufford, K. Karwan, H. Mizzell, and A.W. Badr. "Climate information and water management in the Carolinas." Invited presentation at NOAA Climate Program Office, 13 June 2005.

Dow, K., G.J. Carbone, K. Karwan, H. Mizzell, D. Tufford, and K. Lackstrom. "Perspectives on uncertainty and the utility of climate information in water resources management." *Annual Meeting of the Association of American Geographers*, Denver, CO, April 2005.

Mock, C., M. Hartman, C. Woodhouse, G.J. Carbone, M.D. Anderson, D.O. Mayes, and L. Stroup. "Nineteenth Century Historical Climatic Data in Mountainous Regions of the Western United States." *MTCLIM Conference*, March 2005.

Tufford, D., G. Carbone, and H. Mizzell. "ENSO effects on streamflow and water quality in North and South Carolina." *Climate Prediction Applications Science Workshop*, Palisades, NY, March 2005.

Dow, K., K. Karwan, G. Carbone, K. Lackstrom, H. Mizzell, and D. Tufford. "The Role of Climate Information in the FERC Hydro Licensing Process." *Climate Prediction Applications Science Workshop*, Palisades, NY, March 2005.

Carbone, G., K. Dow, M. Janis, K. Karwan, H. Mizzell, and D. Tufford. "Climate Variability and Water Resources in the Carolinas." Invited paper for special symposium entitled: Impact of Climate Variability on Agricultural and Natural Resource Management at the *Annual Meeting of the Agronomy Society of America*, Seattle, WA, 3 November 2004.

Carbone, G., and K. Dow. "Drought Forecasting in South Carolina." *100th Annual Meeting of the Association of American Geographers*, March 2004.

Carbone, G., and K. Dow. "Resampling Methods for South Carolina Drought Management." *Climate Prediction Applications Science Workshop*, Tallahassee, FL, March 2004.

Filippi, A., and G. Carbone. "Fractal Geometry Application to Agricultural Land use Information Acquisition Using Multiscale Remote Sensing." *100th Annual Meeting of the Association of American Geographers*, March 2004.

Beesley, B., G. Carbone, E.J. Sadler, D. Evans, J. Millen, and C. Camp. "Using Satellite Imagery to Detect Spatial Variability in Corn." *Fourth International Precision Agriculture Conference*, Berlin, 16 June 2003.

Carbone, G., and H. Power, "Integrating Campus Meteorological Data in Environmental Courses." *USC College of Liberal Arts InfoTech*, May 2003.

Carbone, G. "Climate Forecasting for Water Systems." *Annual Meeting of the SC Rural Water Association*, 15 February 2003.

O'Connor, R., K. Dow, B. Yarnal, C. Jacoy, G. Carbone, and A. Heasley. "Who wants climate forecasts? Community water system managers' perceptions of their need for climate information?" *Mississippi River Climate and Hydrology Conference*, New Orleans, LA, 13–17 May 2002.

Carbone, G., K. Dow, B. Yarnal, R. O'Connor, and S. Cutter. "Communicating Drought Severity with Seasonal Forecasts." Poster presentation at Human Dimensions of Global Change Research Program (HDGC) Principal Investigator's (PI) Meeting, Seabrook Island, SC, 24 October 2002.

Dow, K., G. Carbone, S. Cutter, B. Yarnal, and R. O'Connor. "Water Managers' Confidence in Weather and Climate Forecasts." Human Dimensions of Global Change Research Program (HDGC) Principal Investigator's (PI) Meeting, Seabrook Island, SC, 24 October 2002.

Carbone, G. "Creating Drought Scenarios from Climate Forecasts." *Annual SEDAAG Meeting*, Richmond, VA, 24 November 2002.

Carbone, G. "Projected impacts of climate change on soybean production in the southeastern United States." *Annual meeting of the Association of American Geographers*, Los Angeles, CA, 23 March 2002.

Dow, K., and G. Carbone. "Confidence in Weather and Climate Forecasts." *Annual meeting of the Association of American Geographers*, Los Angeles, CA, 22 March 2002.

Carbone, G. "Integrating long-lead forecasts with drought indices." *8th Annual Technical Conference of the Palmetto Chapter of the American Meteorological Society*, Columbia, SC, 15 March 2002.

Carbone, G. "Potential impacts of climate variability and change on southeastern U.S. crop yield." Invited paper presented at the University of Georgia, 1 October 2001.

Dow, K., S.L. Cutter, G.J. Carbone, B. Yarnal, R. O'Connor, D. Bord. "The Potential of Long-Lead Climate Forecasts to Reduce Local Vulnerability to Variations in Interseasonal Climate." *Fourth Open Meeting of the Human Dimensions of Global Environmental Change Research Community* in Rio de Janeiro, Brazil, 6–8 October 2001.

Carbone, G., A. James, and H. McKellar. "Urban rainfall, runoff, and water quality." *Shaping the Ecology of a City Workshop*, Columbia, South Carolina, 26 March 2001.

Carbone, G., and K. Dow. "Use of Long-Lead Climate Forecasts for Water System Management." *South Carolina Environmental Conference*, Myrtle Beach, South Carolina, 20 March 2001.

James, L.A., and G. Carbone. "Runoff relations in a paired watershed study: Exploding the urban-rural dichotomy myth." *Annual Meeting of the Association of American Geographers*, New York, NY, 3 March 2001.

Carbone, G., and L.A. James. "Spatial and temporal character of precipitation and hydrological response in a small watershed." *Annual Meeting of the Association of American Geographers*, New York, NY, 3 March 2001.

Yarnal, B., R. Bord, R. O'Connor, K. Dow, G. Carbone, and S. Cutter. "Potential use of climate forecasts by community water system managers." *Annual Meeting of the Association of American Geographers*, New York, NY, 3 March 2001.

Dow, K., G. Carbone, S. Cutter, B. Yarnal, R. Bord, and R. O'Connor. "Vulnerability of community water systems." *Annual Meeting of the Association of American Geographers*, New York, NY, 1 March 2001.

Tsevtsinskaya, E., L. Mearns, G. Carbone, C. Locke, L. McDaniel, and W. Gao. "Assessing the effect of different spatial resolutions of climate change scenarios on the changes in corn and wheat production in the southeastern United States." *Annual Meeting of the Agronomy Society of America*, Minneapolis, MN, 8 November 2000.

Mearns, L., W. Gao, L. McDaniel, E. Tsevtsinskaya, and G. Carbone. "The issue of spatial scale in integrated assessments: An example of agriculture in the southeastern U.S." *Annual Meeting of the Agronomy Society of America*, Minneapolis, MN, 8 November 2000.

Carbone, G., L. Mearns, E.J. Sadler, and T. Mavromatis. "Assessing model response to interannual variability." *Annual Meeting of the Agronomy Society of America*, Minneapolis, MN, 8 November 2000.

Carbone, G., C. Locke, T. Filippi, B. Kiechle, J. Rainman, J. Sadler, B. Gerwig, and D. Evans. "Using remote sensing and modeling to measure crop biophysical variability." *Fifth International Precision Agriculture Conference*, Minneapolis, MN, 17 July 2000.

Carbone, G., C. Locke, E. Tsvetsinskaya, L.O. Mearns, and L. McDaniel. "Responses of CERES and CROPGRO models to Coarse and Fine Spatial Resolution Climate Change Scenarios in the Southeastern United States." *Annual Meeting of the Association of American Geographers*, Pittsburgh, PA, 6 April 2000.

Mearns, L.O., W. Gao, L. McDaniel, E. Tsvetsinskaya, and G. Carbone. "The Issue of Spatial Scale in Integrated Assessments: An example of Agriculture in the Southeastern U.S." *Annual Meeting of the Association of American Geographers*, Pittsburgh, PA, 6 April 2000.

Yow, D., and G. Carbone. "Orlando, Florida's Urban Heat Island." *Annual Meeting of the Association of American Geographers*, Pittsburgh, PA, 6 April 2000.

Yow, D.M., and G.J. Carbone. "Temporal and Spatial Aspects of Orlando Florida's Urban Heat Island." 2000. 10th Conference on Satellite Meteorology and Oceanography, *American Meteorological Society*, Long Beach, CA, 9-14 January 2000.

Mearns, L.O., G.J. Carbone, W. Gao, L. McDaniel, E. Tsvetsinskaya, B. McCarl, and R. Adams. "The Issue of Spatial Scale in Integrated Assessments: An example of Agriculture in the Southeastern U.S." *11th Symposium on Global Change Studies, American Meteorological Society*, Long Beach, CA, 9-14 January 2000.

Carbone, G., and H. Mizzell. "The correlation of rain gauge precipitation totals with NEXRAD estimates in Lexington county, South Carolina." *South Carolina Water and Environment Conference*, Columbia, SC, 7 April 1999.

Mizzell, H., and G. Carbone. "Correlating rain gauge precipitation and WSR-88D estimates in Lexington County, South Carolina." *Annual Meetings of the Association of American Geographers*, Honolulu, HI, 27 March 1999.

James, L.A., and G. Carbone. "Streamflow in paired southeastern Sandhills watersheds before and during an El Niño rainfall event." *Annual Meetings of the Association of American Geographers*, Honolulu, HI, 26 March 1999.

Stone, B., H. McKellar, B. Atkins, G. Carbone, and L.A. James. "Sediment, coliform bacteria and nitrate runoff in the Mill Creek Watershed, an urbanized catchment in Columbia, SC." *8th Annual Southeastern Lakes Management Conference*, Clemson, SC, 24 March 1999.

Mizzell, H.P., and Carbone, G. "Accuracy of doppler radar precipitation estimates." *American Meteorological Society, Palmetto Chapter Technical Conference*, Columbia, SC, 19 March 1999.

Mearns, L., G. Carbone, and T. Mavromatis. "Validation of CROPGRO-Soybean and CERES-Maize models in the southeastern United States" *Annual Meetings of the Agronomy Society of America*, Baltimore, MD, October 1998.

Carbone, G. "Design and structure of internet sites for disseminating agrometeorological information." *World Meteorological Organization Asian Regional Training Workshop on the dissemination of agrometeorological information*, Doha, Qatar, 19 October 1998.

Carbone, G. "Use of the internet of dissemination of agrometeorological information; Theoretical implications." *World Meteorological Organization Asian Regional Training Workshop on the dissemination of agrometeorological information*, Doha, Qatar, 18 October 1998.

James, L.A., H.N. McKellar, and G.J. Carbone. "Mill Creek Watershed Project: Stream Hydrology and Water Quality. Nonpoint Source Information Exchange." Columbia, SC, 21 April 1998.

Carbone, G., R. Lloyd, R. Bunch, and X. Li. "Comparison of different interpolation techniques with monthly precipitation data." *Annual AAG Meeting*, Boston MA, 26 March 1998.

Carbone, G.J. "Predicting peach bloom and harvest with long-lead forecasts." *Annual Meeting of the Association of American Geographers*, Fort Worth, TX, 2 April 1997.

Carbone, G.J. "Global Climate Change: Understanding complexities, uncertainties, and potential impacts." Invited paper at UNC-Greensboro, 9 April 1997.

Carbone, G.J. "Methodological Issues of Scale in Climate Impact Research." Invited Paper at *NIGEC Workshop: Global Climate Change: Scientific Uncertainties and Environmental Implications*, Bloomington, IN, 3 October 1996.

St. Claire, S.M., and G.J. Carbone. "Temperature Trends in the Southeastern United States, 1900-1993." *Sixty-eighth Annual Meeting of the South Carolina Academy of Science*, Greenville, SC, 7 April 1995.

Carbone, G.J. "Issues of Spatial and Temporal Variability in Climate Impact Studies." *Ninety-first Annual Meeting of the Association of American Geographers*, Chicago, IL, 18 March 1995.

Carbone, G.J., and P.D. Bramante. "The Relationship between Individual Station and Spatially-Averaged Temperature in the Southeastern U.S." *Forty-ninth Annual SEDAAG Meeting*, Virginia Beach, VA, 21 November 1994.

Lloyd, R.E., and G.J. Carbone. "Learning Climates with Neural Networks." *Forty-ninth Annual SEDAAG Meeting*, Virginia Beach, VA, 21 November 1994.

Baker, S.E., and G.J. Carbone. "Incorporating WSR-88D Data into a Geographic Information System." *American Meteorology Society Heavy Precipitation Workshop*, Tucson, AZ, 15 September 1994.

Carbone, G.J. "Use of NEXRAD Data in Orangeburg County, South Carolina." *Annual Meeting of the American Association of State Climatologists*, Madison, WI, 29 July 1994.

Clark, L.L., and G.J. Carbone. "Integration of WSR-88D Data with Other Environmental Data Sets Using GIS Technology." *Sixty-seventh Annual Meeting of the South Carolina Academy of Science*, Aiken, SC, 15 April 1994.

Clark, L.L., and G.J. Carbone. "Integration of NEXRAD Data and GIS Technology in Climate Change Research." *Ninetieth Annual Meeting of the Association of American Geographers*, San Francisco, CA, 30 March 1994.

Carbone, G.J., M. King, and S. Narumalani. "The Use of a Physiological Crop Yield Model to Estimate Climate Impacts at the County Level." *Forty-eighth Annual SEDAAG Meeting*, Greensboro, NC, 23 November 1993.

Carbone, G.J., and S. Narumalani. "Combining Remote Sensing and GIS with Physiological Crop Yield Models." *Eighty-ninth Annual Meeting of the Association of American Geographers*, Atlanta, GA, 9 April 1993.

Narumalani, S., and G.J. Carbone. "The Use of Remote Sensing for Crop Simulation Studies." *Annual ASPRS/ACSM Convention and Exposition*, New Orleans, LA, 18 February 1993.

Carbone, G.J., and M.D. Schwartz. "Vulnerability of Peaches to Winter Temperature Increases." *Forty-seventh Annual SEDAAG Meeting*, Louisville, KY, 23 November 1992.

Carbone, G.J., and M.D. Schwartz. "The Potential Impact of Climatic Change on South Carolina Peaches." *Eighty-eighth Annual Meeting of the Association of American Geographers*, San Diego CA, 19 April 1992.

Carbone, G.J., P.R. Holt, and L.A. James. "Application of GIS Technology to Climate Studies in the Carolinas." *GIS/LIS 1991 Annual Conference and Exposition*, Atlanta, GA, 1 November 1991.

Carbone, G.J. "Measuring Agricultural Response to Climatic Variability and Change." *Annual Meeting of the Agronomy Society of America, Crop Science Society of America, and Soil Science Society of America*, San Antonio, TX, 23 October 1990.

Carbone, G.J. "The Use of Weather and Climate Data in the Introductory Meteorology Curriculum." *Sixty-third Annual Meeting of the South Carolina Academy of Sciences*, Charleston, SC, 30 March 1990.

Carbone, G.J. "Implications of Using Spatially-averaged Data in Crop-weather and Climate Impact Studies." *Sixty-third Annual Meeting of the South Carolina Academy of Sciences*, Charleston, SC, 30 March 1990.

Burt, J.E., and G.J. Carbone. "Incorporation of a One-dimensional Energy Balance Model in an Intermediate-level Climatology Course." *Annual IBM Academic Computing Conference*, Anaheim, CA, 20 July 1989.

Carbone, G.J. "Spatial Averaging of Climatic Variables Used in Physiological Crop Yield Models." *Eighty-sixth Annual Meeting of the Association of American Geographers*, Baltimore, MD, 22 March 1989.

Carbone, G.J. "The Spatial Interaction between Climatic Change and Agricultural Production." University of South Carolina, Columbia, SC, 13 March 1989.

Carbone, G.J., and D.M. Liverman. "Climatic Variability and Climate Impacts in Sonora, Mexico." *Eighty-third Annual Meeting of the Association of American Geographers*, Minneapolis, MN, 6 May 1986.

Carbone, G.J. "Upper Air Circulation Patterns Associated with Wet and Dry Episodes on the Eastern Great Plains." *Great Plains-Rocky Mountain/West Lakes Divisional Meeting of the Association of American Geographers*, Lawrence, KS, 1 November 1984.

Professional Organizations

- American Meteorological Society (AMS)
- Association of American Geographers (AAG)
- American Geophysical Union (AGU)
- Southeast Division of the AAG (SEDAAG)

Committees and Service

Professional Organizations

- Associate Editor, *Physical Geography* (2013–2020)
- NOAA Review Panel: Climate Monitoring (2014)
- NOAA Review Panel: Climate Observations and Analysis Program (2007)
- NOAA Review Panel: Transition of Research Applications to Climate Services (2006)
- National Research Council, Earth Science and Applications from Space (ESAS) Panel on Climate Variability and Change (2005–2006)
- National Integrated Drought Information System (NIDIS) Planning Committee (2005–2006)
- Technical Program and Scientific Advisory Committee for USGS national drought meeting, 2006
- NASA/NOAA Review Panel: Climate and Global Change Analysis and Applications (1997)
- Chair of SEDAAG Audit Committee (1991, 1994, 1995)
- President American Meteorological Society (AMS) Palmetto Chapter (1992–1994)
- Secretary/Treasurer AMS Palmetto Chapter (1989–92)
- Proposal/Manuscript reviews for: NSF, NOAA, NASA, EPA, Sea Grant, Southeast Regional Climate Center, *Annals of the Association of American Geographers*, *Climate Research*, *Climatic Change*, *Geographical Analysis*, *Journal of Climate*, *International Journal of Biometeorology*, *International Journal of Climatology*, *Journal of Applied Meteorology and Climatology*, *Journal of Hydrometeorology*, *Journal of the American Water Resources Association*, *Physical Geography*, *Professional Geographer*, *Southeastern Geographer*

University of South Carolina

- Honors College, Faculty Fellow (2013–present)
- Udall Fellowship Committee (2005–present; chair: 2012–present)
- Distributed Learning Committee (2010–present)
- Graduate Council (2002–2005)
- Undergraduate Research Initiative Committee (2003–present)
- Interdisciplinary Task Force (Provost's Office)
- General Education Task Force (Provost's Office)
- Environmental Advisory Committee (2007–present)
- Liberal Arts, Education, and Related Professional Programs Committee (2002–2005)
- Research and Productive Scholarship (R&PS) Committee (2001–2002)
- SC Honors College Student Advisor (2001–2011)
- University of South Carolina Bookstores Committee (2001–2004)
- Manager, USC Weather Station (Fall 1989–2013)
- Faculty Advisor, USC Habitat for Humanity (Fall 1994–2012)
- Faculty Advisor, Alpha Phi Omega Service Fraternity (Spring 1994–Fall 1998)
- Faculty Advisor, Colleges Against Cancer (Fall 2003–Fall 2004)
- Faculty Advisor, Volleyball Club (Fall 2003–2010)

College

- College of Liberal Arts Distributed Learning Advisory Group (1998–2001)
- Humanities and Social Sciences College Future Committee (1992–1993)

Department

- Chair, USC Geography Department (2010–2013)
- Director of Undergraduate Studies, USC Geography Department (1993–1995, 1997–2001)
- Undergraduate Advisor, USC Geography Department (1990–present)
- Human Geography Search Committee (2006)
- Chair’s Advisory Committee, USC Geography Dept. (1996–1997)
- Admission to Candidacy Committee, Geography Dept. (1998–present)
- Assistantship Committee, Geography Dept. (Fall 1996)
- Colloquium Coordinator (2009–2010)
- Curriculum Committee, USC Geography Department (1992–1997, 2003–present)
- Chair Search Committee, USC Geography Department (1992–1993)
- Graduate Programs Committee, USC Geography Department (1990–1993)
- Ad Hoc Committee on Graduate Programs and PhD Expansion (Summer–Fall 1990)
- Publicity Coordinator (2008–present)
- Faculty Secretary, USC Geography Department (Fall 1989–Spring 1991)
- South Carolina Geographic Alliance Steering Committee (Spring 1994–Fall 1997)
- Faculty Advisor, Geography Club (Fall 1993–2000)
- Ethics Committee, USC Geography Dept. (1990–1993)

Thesis and Dissertation Committees

Undergraduate Honors Thesis Committees (5, 4 supervised*)

- 2004 Marie Bergen*, Maura Kurtz*
- 2011 Sarah Ali*
- 2017 Kate Kacsur (Env. Sci.)
- 2018 Kayla Gardner* (MSCI)
- 2020 Mattie Hibbs (Geography, Statistics)
- 2020 Cecelia Taylor (Business)

Master's Thesis Committees (50, 15 supervised*)

- 1991 Valerie Conerway, Andrew Cordova, Michele Eshenbaugh*, Paul Holt, Christopher Keithly, Philip Paradies
- 1992 Parveen Darbar, John Morris, Ian Turner*
- 1993 Fiona Renton
- 1994 Peter Bramante*, Michael Burdett*, Christopher Curlis, Bernard Folker*
- 1995 Patrick Curley, Martin Roberge
- 1996 William English, Matthew Sposato

1997 David Alexander
1999 Yongjun Lei, Christopher Locke*, Hope Mizzell*,
2000 James Stapel, Donald Yow*
2001 Pierre d’Autel*, Tom Toland
2002 Jan Mojzisek, Toshi Matusi (Geology)
2003 William Kiechle*, Tara Koman, Kevin Riordan
2004 Melanie Bartis, Laura Stroup
2006 Lauren Gregory*, Doug Mayes,
2007 Victoria Bonvento (Geology), Belinda Gravel (MEERM)
2008 Erika Hartwig*, Sara Yorty
2009 Ian Millar*
2011 Laura Felker
2012 Patrick Barrineau
2014 Bonnie Epstein*, Katie Ertell, Brett Sexton (MEERM)
2015 Kim Rodgers*, Wesley Skeeter
2018 Raelene Campbell, Ellie Davis, Michael Stewart
2020 Ricky Brokaw (MSCI), Rachel Nichols (MSCI), Casey Shoup (MSCI)

PhD Dissertation Committees (28, 5 supervised*)

1993 Cheryl Hallam, Sunil Narumalani
1994 John Althausen
1995 Patrick Bresnahan
1996 Pavel Romashkin (Geology)
1997 Eugeney Karabanov (Geology), Alexander Prokopenko (Geology)
1998 Richard Collins, Kyungtaek Oh (Political Science), Michael Scott
2002 Arleen Hill,
2003 Donald Yow*
2004 Jamie Mitchem, David Vaughan
2006 Kimberly Meitzen
2007 Jinyoung Rhee*
2008 Hope Mizzell*, Laura Stroup, Shama Perveen
2009 Michelle Gierach (MSCI)
2011 Mauro Maza (MSCI)
2012 Erik Kabelá*, Elizabeth Fly, Nathan Kettle
2015 Kirsten Lackstrom
2017 Alexandria McCombs
2018 Junyu Lu*, Chen-Ling Hung
2020 Nicholas Sokol*