

Yunsoo Choi

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Key Research Foci

- Atmospheric Chemistry
- Air quality Modeling
- Regional chemical transport modeling
- Machine learning/Artificial Intelligence for air quality applications
- Data Assimilation for air quality applications
- Satellite remote sensing
- Energy Policy

Experience

- Assistant Professor (September 2012 – Present) the University of Houston, Department of Earth and Atmospheric Sciences, Houston, TX
Leading University of Houston Air Quality Forecasting (UH-AQF) Group
- Research Scientist (April 2012 – August 2012) SSAI, NASA GSFC, US Aura OMI Science Team, Greenbelt, MD
Evaluated OMI satellite NO₂ and SO₂ retrieval products with CTM
- Senior Research Associate (June 2010 – April 2012) ERT, NOAA/ARL, Air Quality Forecasting Group, Silver Springs, MD
Maintained and updated National Air Quality Forecasting Capability (NAQFC) Forecasting System at NOAA ARL
- Senior Scientific Data Analyst (February 2010 – May 2010) STC, NOAA/ARL, Air Quality Forecasting Group, Silver Spring, MD
Analyzed the simulation products of the National Air Quality Forecasting Capability (NAQFC) Forecasting System
- Postdoctoral Research Scientist (September 2007 – February 2010) California Institute of Technology, Jet Propulsion Laboratory, Tropospheric Emission Spectrometer (TES) team, Pasadena, California
Evaluated satellite retrieval products with regional chemical transport model
- ACDR Seminar Chair, September 2008 – February 2010. California Institute of Technology, Jet Propulsion Laboratory, Pasadena, California
Coordinated ACDR seminar at JPL/Caltech
- Graduate School Researcher, September 2002 – June 2007
Georgia Institute of Technology, School of Earth and Atmospheric Sciences, Atlanta, Georgia
Developed/evaluated the 0D, 1D, and 3D Regional chEmical trAnsport Model (REAM)
- Graduate School Researcher (Atmospheric Chemistry), September 2000 – June 2002

University of California, Irvine, Department of Chemistry, Irvine, California
Measured VOC components using gas chromatography/mass spectrometry

- Laboratory Engineer (Analytical Chemistry), September 1999 – June 2000
Department of Chemistry, the University of California at Irvine, California
Managed the VOC measurement system at the Donald/Rowland Group
- Graduate School Researcher (Biophysical Chemistry), September 1997 – June 1999
Department of Chemistry, University of California, Irvine, California
Designed a biopolymer using molecular dynamics simulation
- Graduate School Researcher (Physical Chemistry), 1994-1996
Hanyang University, Department of Chemistry, Seoul Korea:
Designed a biopolymer using molecular dynamics simulation

Education

Ph.D., Atmospheric Chemistry and Remote Sensing, School of Earth and Atmospheric Sciences
Georgia Institute of Technology, Atlanta, Georgia (June 2007). Supervised by Dr. Yuhang Wang
Thesis Title: "Spring to Summer Transitions of Ozone and Its Precursors over North America and
Photochemistry Over Antarctica."

M.S., Biophysical Chemistry/Atmospheric Chemistry, Department of Chemistry, University of
California, Irvine, California (June 1999). Completed coursework and passed the advanced exam

M.S., Physical Chemistry, Department of Chemistry, Hanyang University, Seoul, Korea (1996)
Thesis Title: "Solvent modified structure of BPTI."

B. S., Chemistry, Department of Chemistry, Hanyang University, Seoul, Korea (1994)

1. Research, Scholarship, and Other Creative Productivity:

a. Scholarly/Creative Work: Publications (pre-reviewed journals with* myself, a student or a postdoc):

1. Jeon*, W., **Choi, Y.**, Souri*, A.H., Roy*, A., Diao*, L., Pan*, S., Lee, H.W., Lee, S-H., 2017, Identification of chemical fingerprints in long-range transport of burning induced upper tropospheric ozone from Colorado to the North Atlantic Ocean, *Science of the Total Environment* (IF=4.9), 613-614, 820-828, doi.org/10.1016/j.scitotenv.2017.09.177
2. Pan*, S., **Choi, Y.**, Roy*, A., and Jeon,* W., **2017**, Allocating emissions to 4km and 1km horizontal spatial resolutions and its impact on simulated NO_x and O₃ in Houston, TX, in *Atmospheric Environment* (IF=3.6), 164, 398-415
3. Jeon*, W., **Choi, Y.**, Roy*, A., Pan*, S., Price, D., Hwang, M., Kim, K., and Oh, I., **2017**, Investigation of Primary Factors Affecting the Variation of Modeled Oak Pollen Concentrations: A case study for Southeast Texas in 2010, accepted in *Asia-Pacific Journal of Atmospheric Sciences* (IF=1.7)

4. Kotsakis*, A., Morris G.A., Lefer, B., Jeon*, W., Roy*, A., Minschwarner, K., Thompson, A.M., and **Choi, Y., 2017**, Ozone production by corona discharges during a convective event in DISCOVER-AQ Houston, in *Atmospheric Environment*, 161, 13-17 (IF=3.6)
5. Leong, Y., Sanchez, N., Wallace, H., Karakurt Cevik, B., Hernandez, C., Han, Y., Flynn, J., Massoli, P., Floerchinger, C., Fortner, E., Herndon, S., Bean, J., Hildebrandt Ruiz, L., Jeon*, W., **Choi, Y.**, Lefer, B., Griffin, R., **2017**, Overview of Surface measurements and Spatial Characterization of Submicron Particulate matter during the DISCOVER-AQ 2013 Campaign in Houston, in *Journal of Air & Waste Management Association*, doi:10.1080/10962247.2017.1296502 (IF=1.6)
6. Souri*, A. H., **Choi, Y.**, Jeon*, W., Woo, J-H., Zhang, Q., Kurokawa, J-I, **2017**, Remote-sensing evidence of decadal changes in major tropospheric ozone precursors over East Asia, *Journal of Geophysical Research – Atmosphere*, doi:10.1002/2016JD025663 (IF=3.6)
7. Pan*, S., **Choi, Y.**, Jeon*, W., Roy*, A., Westenbarger, D., and Kim, H., **2016**, Impact of high-resolution sea surface temperature, emission spikes and wind on simulated surface ozone in Houston, Texas during a high ozone episode, *Atmospheric Environment*, doi:10.1016/j.atmosenv.2016.12.030 (IF=3.6)
8. Roy*, A. and **Choi, Y.**, **2016**, Effect of ambient temperature on species lumping for total organic gases in gasoline exhaust emissions, *Atmospheric Environment*, doi:10.1016/j.atmosenv.2016.11.057 (IF=3.6)
9. Jeon*, W., **Choi, Y.**, Percell, P., Souri*, A.H., Song, C., Kim, S., and Kim, J., **2016**, Computationally efficient air quality forecasting tool: Implementation of STOPS v1.5 model into CMAQ v5.0.2 for a prediction of Asian dust, *Geoscientific Model Development*, 9(10), 3671-3684 (IF=3.5)
10. Diao*, L., **Choi, Y.**, Czader*, B., Li*, X., Roy*, A., Jeon*, W., **2016**, Discrepancies between modeled and observed nocturnal isoprene in an urban environment and the possible causes: A case study in Houston, *Atmospheric Research*, 181, 257-264 (IF=3.8)
11. Roy*, A., Soontag, D., Cook, R., Yanca, C., Schenk, C., and **Choi, Y.**, **2016**, Effect of Ambient Temperature on Total Organic Gas Speciation Profiles from Light-Duty Gasoline Vehicle Exhaust, *Environmental Science and Technology*, 50(12), 6565-6573 (IF= 6.2)
12. Li*, X., **Choi, Y.**, Czader*, B., Roy*, A., Kim, H., Lefer, B., and Pan*, S., **2016**, The impact of observation nudging on simulated meteorology and ozone concentrations during DISCOVER-AQ 2013 Texas campaign, *Atmospheric Chemistry and Physics*, 16, 3127-3144 (IF = 5.3)
13. Diao*, L., Roy*, A., Czader*, B., Pan*, S., Jeon*, W., Souri*, A.H., **Choi, Y.**, **2016**, Modeling the effect of relative humidity on nitrous acid formation in the Houston area, *Atmospheric Environment*, 131, 78-82 (IF=3.6)
14. Souri*, A.H., **Choi, Y.**, Jeon*, W., Li*, X., Pan*, S., Diao*, L., Westenbarger, D., **2016**, Constraining NO_x emissions using satellite NO₂ measurements during 2013 DISCOVER-AQ Texas campaign, in *Atmospheric Environment*, 131, 371-381 (IF=3.6)

15. Souri*, A.H., **Choi, Y.**, Li*, X., Kotsakis*, A., Jiang, X., **2016**, A 15-year climatology of wind pattern impacts on surface ozone in Houston, Texas, in *Atmospheric Research*, 174, 124-134 (IF=3.8)
16. Bella, D., Culpepper, J., Khaimova, J., Ahmed, N., Belkalai, Adam, Arroyo, I., Andrews, J., Gentle, S., Emmanuel, S., Lahmouh, M., Ealy, J., King, Zayna, Jenkins, O., Fu, D., **Choi, Y.**, Osterman, G., Gruszczynski, J., Skeete, D., Blaszcak-Boxe, C.S., **2015**, Characterization of pollution transport into Texas using OMI and TES satellite, GIS and in situ data, and HYSPLIT back trajectory analyses: implications for TCEQ State Implementation Plans, in *Air Qual Atmos Health*, Springer Netherlands, p. 1 (IF=3.2)
17. **Choi, Y.**, Souri*, A.H., **2015**, Seasonal behavior and long-term trends of tropospheric ozone, its precursors and chemical conditions over Iran: A view from space, in *Atmospheric Environment*, v. 106, p. 232-240 (IF=3.6)
18. **Choi, Y.**, Souri*, A.H., **2015**, Chemical condition and surface ozone in large cities of Texas during the last decade: Observational evidence from OMI, CAMS, and model analysis, in *Remote Sensing of Environment*, 168, 90-101 (IF= 6.3)
19. Czader*, B. H., **Choi, Y.**, Li*, X., Alvarez, S., Lefer, B., **2015**, Impact of updated traffic emissions on HONO mixing ratios simulated for urban site in Houston, Texas, in *Atmos. Chem. Phys.*, Copernicus Publications, 15(3), 1253-1263 (IF=5.3)
20. Jeon*, W., **Choi, Y.**, Lee, H.W., Lee, S., Yoo, J., Park, J., Lee, H., **2015**, A quantitative analysis of grid nudging effect on each process of PM_{2.5} production in the Korean Peninsula, in *Atmospheric Environment*, 122, 763-774 (IF=3.6)
21. Pan*, S., **Choi, Y.**, Roy*, A., Li*, X., Jeon*, W., Souri*, A.H., **2015**, Modeling the uncertainty of several VOC and its impact on simulated VOC and ozone in Houston, Texas, in *Atmospheric Environment*, 120, 404-416 (IF=3.6)
22. Roy*, A., **Choi, Y.**, **2015**, New Directions: Potential impact of changing the coal-natural gas split in power plants: An emissions inventory perspective for criteria pollutants, in *Atmospheric Environment*, 102, 413-415 (IF=3.6)
23. Roy*, A., **Choi, Y.**, **2015**, Temperature dependence of source specific volatility basis sets for motor vehicle exhaust, in *Atmospheric Environment*, 119, 258-261 (IF=3.6)
24. Czader*, B., Percell, P., Byun, D., Kim, S., **Choi, Y.**, **2015**, Development and evaluation of the Screening Trajectory Ozone Prediction System (STOPS, version 1.0), in *Geosci. Model Dev.*, 8, 1383-1394 (IF=3.5)
25. Lee, Y., Kim, J., Ho, C., An, S., Cho, H., Mao, R., Tian, B., Wu, D., Lee, J., Kalashnikova, O., **Choi, Y.**, Yeh, S., **2015**, The effects of ENSO under negative AO phase on spring dust activity over northern China: an observational investigation, in *International Journal of Climatology*, 35 (6), 935-947 (IF=3.8)
26. Choi, S., Joiner, J., **Choi, Y.**, Duncan, B. N., Vasilkov, A., Krotkov, N., Bucsela, E., **2014**, First estimates of global free-tropospheric NO₂ abundances derived using a cloud-slicing technique

- applied to satellite observations from the Aura Ozone Monitoring Instrument (OMI), in *Atmos. Chem. Phys.*, Copernicus Publications, 14, 19, 10565-10588 (IF=5.3)
27. **Choi, Y., 2014**, The impact of satellite-adjusted NO_x emissions on simulated NO_x and O₃ discrepancies in the urban and outflow areas of the Pacific and Lower Middle US, in *Atmos. Chem. Phys.*, Copernicus Publications, 14(2), 675-690 (IF=5.3)
 28. **Yunsoo Choi**, Hyuncheol Kim, Daniel Tong, and Pius Lee, Summertime weekly cycles of observed and modeled NO_x and O₃ concentrations as a function of satellite-derived ozone production sensitivity and land use types over the Continental United States, 2012, *Atmospheric Chemistry and Physics*, 12, 6291-6307 (IF=5.3)
 29. Chun Zhao, Yuhang Wang, Rong Fu, Derek Cunnold, and **Yunsoo Choi**, Impact of East Asia summer monsoon on the air quality over China: The view from space, 2010, *Journal of Geophysical Research*, doi:10.1029/2009JD012745 (IF=3.4)
 30. Qing Yang, Derek Cunnold, **Yunsoo Choi**, Yuhang Wang, Ray Wang, Lucien Froidervaux, Anne Thompson, and Pawan Bhartia, A study of tropospheric ozone column enhancements over North America using satellite data and a global chemical model, 2010, *Journal of Geophysical Research*, doi:10.1029/2009JD012616 (IF=3.4)
 31. **Yunsoo Choi**, Gregory Osterman, Annmarie Eldering, Yuhang Wang, and Eric Edgerton, Understanding the contributions of anthropogenic and biogenic sources to CO enhancements and outflow observed over North America and the western Atlantic Ocean by TES and MOPITT, 2010, *Atmospheric Environment*, doi:10.1016/j.atmosenv.2010.01.029 (IF=3.6)
 32. **Yunsoo Choi**, Jinwon Kim, Annmarie Eldering, Gregory Osterman, Yuk L. Yung, and K. N. Liou, Lightning and anthropogenic NO_x sources over the U.S. and the western North Atlantic Ocean: Impact on OLR and radiative effects, 2009, *Geophysical Research Letters*, 36, L17806, doi:10.1029/2009GL039381 (IF=4.5)
 33. Chun Zhao, Yuhang Wang, **Yunsoo Choi**, and Tao Zeng, Summertime impacts of convective transport and lightning NO_x production over North America: modeling dependence on meteorological simulations, 2009, *Atmospheric Chemistry and Physics*, 9, 4315-4327 (IF=5.3)
 34. **Yunsoo Choi**, Yuhang Wang, Qing Yang, Derek Cunnold, Tao Zeng, Changsub Shim, Ming Luo, Annmarie Eldering, Eric Bucsela, and James Gleason, Spring to summer northward migration of high O₃ over the western North Atlantic, 2008, *Geophysical Research Letters*, 35, L04818, doi:10.1029/2007GL032276 (IF=4.5)
 35. **Yunsoo Choi**, Yuhang Wang, Tao Zeng, Derek Cunnold, Eun-Su Yang, Randall Martin, and Kelly Chance, Valerie Thouret, and Eric Edgerton, Springtime transition of NO₂, CO, and O₃ over North America: Model evaluation and analysis, 2008, *Journal of Geophysical Research*, 113, D20311, doi:10.1029/2007JD009632 (IF=3.4)
 36. Burcak Kaynak, Yongtao Hu, Randall V. Martin, Armistead Russell, **Yunsoo Choi**, and Yuhang Wang, The effect of lightning NO_x production on surface ozone in the continental United States, 2008, *Atmospheric Chemistry and Physics*, 8, 5151-5159 (IF=5.3)

37. Serge Guillas, Jinghui Bao, **Yunsoo Choi** and Yuhang Wang, Statistical correction and downscaling of chemistry-transport model ozone forecasts over Atlanta, 2008, Atmospheric Environments, 42(6), 1338-1348 (IF=3.6)
38. Yuhang Wang, **Yunsoo Choi**, Tao Zeng, Douglas Davis, Martin Buhr, L. Gregory Huey, and William Neff, Assessing the photochemical impact of snow NO_x emissions over Antarctica during ANTCI 2003, 2007, Atmospheric Environments, 41(19), 3944 (IF=3.6)
39. Jing Ping, Derek Cunnold, **Yunsoo Choi** and Yuhang Wang, Summertime tropospheric ozone columns from Aura OMI/MLS measurements versus regional model results over the United States, 2006, Geophysical Research Letters, 33(17), L17817 (IF=4.5)
40. Yuhang Wang, **Yunsoo Choi**, Tao Zeng, Brian Ridley, Nicola Blake, Donald Blake and Frank Flocke, Late-spring increase of trans-Pacific pollution transport in the upper troposphere, 2006, Geophysical Research Letters, 33, L01811 (IF=4.5)
41. **Yunsoo Choi**, Yuhang Wang, Tao Zeng, Randall Martin, Thomas Kurosu and Kelly Chance, Evidence of lightning NO_x and convective transport of pollutants in satellite observations over North America, 2005, Geophysical Research Letters, 32, L02805 (IF=4.5)
42. Changsub Shim, Yuhang Wang, **Yunsoo Choi**, Paul I. Palmer, Dorian S. Abbot and Kelly Chance, Constraining global isoprene emissions with Global Ozone Monitoring Experiment (GOME) formaldehyde column measurements, 2005, Journal of Geophysical Research, 110, D24301 (IF=3.4)
43. Yuhang Wang, Changsub Shim, Nicola Blake, Donald Blake, **Yunsoo Choi**, Brian Ridley, Jack Dibb, Anthony Wimmers, Jennie Moody, Frank Flocke, Andrew Weinheimer, Robert Talbot and Elliot Atlas, Intercontinental transport of pollution manifested in the variability and seasonal trend of springtime O₃ at northern middle and high latitudes, 2003, Journal of Geophysical Research, 108(D21), 4683 (IF=3.4)
44. **Yunsoo Choi**, Scott Elliott, Isobel J. Simpson, Donald R. Blake, Jonah J. Colman, Manvendra K. Dubey, Simone Meinardi, F. Sherwood Rowland, Tomoko Shirai and Felisa A. Smith, Survey of whole air data from the second airborne Biomass Burning and Lightning Experiment using principal component analysis, 2003, Journal of Geophysical Research, 108(D5), 4163 (IF=3.4)
45. J. Alfredo Freites, **Yunsoo Choi**, and Douglas J. Tobias, Molecular Dynamics Simulations of a Pulmonary Surfactant Protein B Peptide in a Lipid Monolayer, 2003, Biophysical Journal, 84(4), 2169-2180 (IF=3.8)

b. Other indicators of Scholarly Contributions (Invited & Conference Presentations)

- a. Developed UH Air Quality Forecasting system over Southeast Texas (<http://spock.geosc.uh.edu>) (since 2013)
- b. Developed UH Air Quality Forecasting system over the US (<http://spock.geosc.uh.edu>) (since 2013)

- c. Developed UH biomass burning Query System over the US (spock.geosc.uh.edu/query.html) (since 2016)
- d. **Invited presentations**
 1. Choi, Y. et al., Use of Deep learning for weather and air quality forecasting: a case study in Houston & Seoul, September 4th, 2017, Yonsei University, Seoul Korea
 2. Choi, Y. et al., Integration Surface and Satellite Observations to Provide an Optimal Estimate of Surface Distribution of PM, September 4th, 2017, Yonsei University, Seoul Korea
 3. Choi, Y. et al., The use of Artificial Intelligence Deep Learning to predict ozone concentrations over Seoul, September 6th, 2017, Seoul National University, Seoul Korea
 4. Choi, Y. et al., Use of Deep learning for weather and air quality forecasting: a case study of forecasting wind fields and ozone in Houston, May 11th, 2017, National Institute of Meteorological Sciences, Jeju Korea
 5. Choi, Y. et al., Data Assimilation case study: Remote-sensing evidence of decadal changes in tropospheric NO_x over East Asia, May 12th, 2017, National Institute of Meteorological Science, Jeju Korea
 6. Choi, Y. et al., 1. Remote sensing and data assimilation & 2. Deep learning air quality forecasting, April 3rd, 2017, Gwangju Institute of Science and Technology (GIST), Gwangju Korea
 7. Choi, Y. et al., Remote-sensing evidence of decadal changes in major tropospheric NO_x over East Asia, April 4th, 2017, Korean Institute of Science Technology (KIST), Seoul Korea
 8. Choi, Y. et al., The use of deep machine learning for weather/air quality forecasting, April 4th, 2017, Ewha Womans University, Seoul Korea
 9. Choi, Y. et al., Remote sensing-Sensing evidence of decadal changes in major tropospheric NO_x over East Asia, April 4th, 2017, KIAPS, Seoul Korea
 10. Choi, Y. et al., The use of deep machine learning for weather/air quality forecasting, April 5th, 2017, National Institute of Environmental Research, Incheon Korea
 11. Choi, Y. et al., Remote-sensing evidence of decadal changes in major tropospheric ozone precursors over East Asia, December 8th, 2016, Ewha Womans University, Seoul Korea
 12. Choi, Y. et al., A hybrid Eulerian/Lagrangian model, STOPS, June 17th, 2016, Pusan National University, Pusan Korea
 13. Choi, Y. et al., Bayesian inverse modeling applications using remote sensing data, June 17th, 2016, Pusan National University, Pusan Korea

14. Choi, Y., et al., Chemical condition and surface ozone in urban cities of Texas during the last decade: observational evidence from OMI, CAMS, and model analysis, April 2015, HGAC, Houston, TX
15. Choi, Y., et al., modeling the uncertainty of several VOC and its impact on simulated VOC and ozone in Houston, Texas, October 2015, HGAC, Houston, TX
16. Choi, Y., Climate change from Air Quality Forecasting Modeler, International Workshop on SLCPs in Asia: Chemistry-climate modeling and its application February 2016, Incheon, Korea
17. Choi, Y., UH Air Quality Forecasting and its application, February 2015, University of Texas Health, Houston, TX
18. Choi, Y., The impact of observational nudging and nesting on the simulated meteorology and ozone concentrations from WRF-CMAQ during the DISCOVER-AQ 2013 Texas Campaign, July 21, 2014, Southeast Texas Photochemical Modeling Technical Committee meeting, Houston-Galveston Area Council, Houston, TX
19. Choi, Y., UH Air Quality Forecasting: Today and tomorrow, March 7, 2014, The University of Texas Health Science Center at Houston, Houston, TX
20. Choi, Y., Automatic daily evaluation of UH AQF system, February 27, 2014, Southeast Texas Photochemical Modeling Technical Committee meeting, Houston-Galveston Area Council, Houston, TX
21. Choi, Y., UH Air Quality Forecasting: DISCOVER-AQ Houston, January 23, 2014, Department of Civil and Environmental Engineering, Department regular seminar, University of Houston, Houston, TX
22. Choi, Y., Comparison of CMAQ surface PM_{2.5} with AIRNow measurements, November 21, 2013, Regional Air Quality Planning Advisory Committee meeting, H-GAC, Houston, TX
23. Choi, Y., UH Air Quality Forecasting: What happened last month?, November 7, 2013, Monthly meeting for DISCOVER-AQ team project, Houston, TX (online team meeting)
24. Choi, Y., UH air quality forecasting, October 13, 2013, Department of Earth and Atmospheric Sciences, Department regular seminar, University of Houston, Houston, TX
25. Choi, Y., Tropospheric O₃ & UH air quality forecasting, July 9, 2013, Texas Commission on Environmental Quality, Austin, TX

26. Choi, Y., Human and Lightning tropospheric/surface O₃ & UH air quality forecasting system, June 18, 2013, Ewha Women's University, Seoul, Korea
27. Choi, Y., Air Quality Forecasting system and its application, March 26, 2013, Southeast Texas Photochemical Modeling Technical Committee Meeting, Houston-Galveston Area Council, Houston, TX
28. Choi, Y., Human and Lightning tropospheric/surface O₃ & UH air quality and climate forecasting system, March 1, 2013, Texas Commission on Environmental Quality, Austin, TX
29. Choi, Y., Human and Lightning contribution to tropospheric O₃: The view from Space, January 18, 2013, Lecture series of Civil and Environmental Engineering, Rice University, Houston, TX
30. Choi, Y., The human and lightning contribution to tropospheric O₃ and surface O₃ sensitivity over chemical regimes: view from space to ground, March 26, 2012, University of Houston, Houston, TX
31. Choi, Y., Summertime National Air Quality Forecasting Capability (NAQFC) O₃ predictions over the United States, October 6, 2011, NOAA Air Resources Laboratory, Silver Springs, MD
32. Choi, Y., Improving summertime CMAQ O₃ predictions over satellite-derived chemical regimes, September 9, 2011, Department of Atmospheric and Oceanic Science, University of Maryland, Silver Springs, MD
33. Choi, Y., Weather and Remote Sensing on Air Quality Forecasting, April 22, 2011, Korean-American Scientist and Engineer Association (KSEA) Southeastern Regional Conference 2011, Atlanta, Georgia.
34. Choi, Y., VOC/NO_x ratio change and convection footprint of CO call for GEMS: Perspective from OMI and TES, August 24, 2010, International GEMS Workshop, Yonsei University, Seoul, Korea.
35. Choi, Y., Lightning and anthropogenic NO_x sources over the US and the Atlantic: Impact on tropospheric O₃ and radiative effects, Oct 2009, California State University at Fullerton, Fullerton, California.
36. Choi, Y., Lightning and anthropogenic NO_x sources over the United States and the western North Atlantic Ocean: Impact on OLR and radiative forcing, May 2009, California Institute of Technology, Pasadena, California.

37. Choi, Y., Enhancements in tropospheric CO over North America and the western Atlantic Ocean observed by TES and MOPITT: Biogenic and anthropogenic sources, Feb 2009, National Center for Atmospheric Research, Boulder, Colorado.
38. Choi, Y., Remote sensing based atmospheric chemistry perspective on summertime features: Summer' heat and cloud convection with lightning, 2009, April, ACDR seminar, Jet Propulsion Laboratory, Pasadena, California.
39. Choi, Y., Upper and lower tropospheric perturbations on O₃ and its precursors from space: Lightning NO_x and biogenic-derived CO, 2008, Yuk L. Yung lunch Seminar, California Institute of Technology, Pasadena, California.
40. Choi, Y., Tropospheric perturbations on O₃ and its precursors from remote sensing measurements, June 2008, Yonsei University, Seoul, Korea.
41. Choi, Y., Modeling analysis of lightning NO_x production and biogenic VOC emissions in the troposphere from space-borne measurements, June 2008, Hanyang University, Seoul, Korea.
42. Choi, Y., Modeling analysis of upper and lower tropospheric perturbations on O₃ and its precursors in the troposphere: Enhanced lightning activity and high surface temperature, June 2008, Seoul National University, Seoul, Korea.
43. Choi, Y., Upper and lower tropospheric enhancements of O₃ and its precursors in the troposphere: Lightning NO_x production and biogenic VOC emissions, June 2008, Busan National University, Busan, Korea.
44. Choi, Y., Convection and surface temperature derived upper and lower tropospheric perturbations on O₃ and its precursors, June 2008, Kwangju Institute of Technology, Kwangju, Korea.
45. Choi, Y., NO₂, CO, and O₃ over North America on the basis of in situ and satellite measurements, February 2007, Jet Propulsion Laboratory, Pasadena, California.

e. **Conference Presentations:**

1. Souri, A.H., **Choi, Y.**, Jeon, W., Diao, L., and Pan. S., Quantifying the impact of biomass burning on major inorganic aerosols in the US: The role of emissions and water released from biomass, September 2017, MAC MAQ conference, UC Davis, CA

2. Souri, A., **Choi, Y.**, Jeon, W., Kochanski, A.K., Diao, L., Mandel, J., and Pan, S., Remote-Sensing evidence of decadal changes in major tropospheric ozone precursors over East Asia, October 2016, the 7th GEMS science team meeting, Seoul, Korea
3. Eslami, E., **Choi, Y.**, Souri, A.H., Pan, S., and Roy, A., Wavelet Transform-based statistical analysis of air quality time-series: an upscaling/downscaling approach, June 2016, 2016 APCC Statistical Downscaling Workshop, Pusan, Korea
4. **Choi, Y.**, Climate change from air quality forecasting modeler, February 2016, the 2nd International Workshop on SLCPs in Asia: Chemistry-climate modeling and its application, Incheon, Korea
5. Kotsakis, A., **Choi, Y.**, Flynn, J.H., Erickson, M., Souri, A., Lefer, B., Morris, G., Estes, M., and Westenbarger, D., Impact of Synoptic & Global scale features on the year-to-year variability of ozone exceedances in Houston, January 2016, New Orleans, LA
6. Jeon, W., **Choi, Y.**, Lee, H-W., Lee, S-H., Yoo, J-W., Park, J., and Lee, H-J., A quantitative analysis of grid nudging effect on each process of PM_{2.5} production in the Korean Peninsula, October 2015, Chapel Hill, NC
7. Souri, A.H., **Choi, Y.**, Diao, L., and Li, X., Nitrogen Oxide Emissions Constrained by Space-based observations of NO₂ column over Southeast Texas, October 2015, Chapel Hill, NC (oral)
8. Pan, S., **Choi, Y.**, Roy, A., Li, X., Jeon, W., and Souri, A.H., Modeling the uncertainty of several VOC and its impact on simulated VOC and ozone in Houston, Texas, 2015, Chapel Hill, NC
9. **Choi, Y.** and Souri, A.H., Chemical condition and surface ozone in large cities of Texas during the last decade: observational evidence from OMI, CAMS, and model analysis, 2015, Chapel Hill, NC (oral)
10. Czader, B., Percell, P., Byun, D., and **Choi, Y.**, Development and evaluation of a Hybrid Eulerian-Lagrangian Modeling Approach, December 2014, San Francisco, CA
11. Diao, L, **Choi, Y.**, Czader, B., Li, X., and Estes, M., Underestimation of isoprene emissions in Houston during Texas 2013 DISCOVER-AQ campaign, December 2014, San Francisco, CA
12. Li, X., **Choi, Y.**, and Czader, B., The impact of the observational meteorological nudging and nesting on the simulated meteorology and ozone concentrations from WRF-SMOKE-CMAQ during DISCOVER-AQ 2013 Texas campaign, December 2014, CA
13. Czader, B., Percell, P., Byun, D., and **Choi, Y.**, Development and evaluation of a Hybrid Eulerian-Lagrangian Modeling Approach, October 2014, Chapel Hill, NC (oral)

14. Diao, L., **Choi, Y.**, Czader, B., Li, X., and Estes, M., Underestimation of isoprene emissions in Houston during Texas 2013 DISCOVER-AQ campaign, October 2014, Chapel Hill, NC
15. Li, X., **Choi, Y.**, and Czader, B., The impact of the observational meteorological nudging and nesting on the simulated meteorology and ozone concentrations from WRF-SMOKE-CMAQ during DISCOVER-AQ 2013 Texas campaign, October 2014, Chapel Hill, NC (oral)
16. Czader, B., **Choi, Y.**, Li, X., Diao, L., Lefer, B., Alvarez, S., and Judd, L., Modeling nitrous acid (HONO) for Houston, NASA Air Quality Applied Science Team Meeting, January 2014, Houston, TX
17. Diao, L., **Choi, Y.**, Czader, B., Choi, S., Joiner, J., and Kim, H., The evaluation of air quality forecasting system based on WRF-CMAQ and WRF-Chem over Houston during the DISCOVER-AQ Houston: surface O₃, PM_{2.5} and tropospheric NO₂, NASA Air Quality Applied Science Team meeting, January 2014, Houston, TX
18. Diao, L., **Choi, Y.**, and Czader, B., Lightning and anthropogenic NO_x sources over the United States during the Deep Convective Clouds & Chemistry (DC3) field campaign: impact on tropospheric NO_x, O₃ and outgoing longwave radiation, December 2013, American Geophysical Union Meeting, San Francisco, CA
19. Choi, S., Joiner, J., Krotov, N., **Choi, Y.**, Duncan, B., Celarier, A., Bucsela, E., Vasikov, P., Veeckind, J., Cohen, R., Weinheimer, J., and Pickering K., Estimates of free-tropospheric NO₂ abundance from the Aura Ozone Monitoring Instrument (OMI) using Cloud Slicing Technique, December 2013, American Geophysical Union Meeting, San Francisco, CA
20. **Choi, Y.**, Czader, B., Diao, L., Rodriguez, J., and Jeong, G., The effects of atmospheric chemistry on radiation budget in the Community Earth System Model, December 2013, American Geophysical Union Meeting, San Francisco, CA
21. Diao, L., **Choi, Y.**, Czader, B., Choi, S., Joiner, J., and Kim, H., The evaluation of air quality forecasting system based on WRF-CMAQ and WRF-Chem over Houston during the DISCOVER-AQ Houston: surface O₃, PM_{2.5} and tropospheric NO₂, October 2013, Community Modeling and Analysis meeting, Chapel Hill, NC
22. Czader, B., **Choi, Y.**, and Diao, L., Sensitivity to changes in HONO emissions from mobile sources simulated for Houston area, October 2013, CMAS meeting, Chapel Hill, NC (oral)
23. **Yunsoo Choi**, NO_x emissions uncertainty of the EPA NEI 2005 over the Southern US, January 2013, American Meteorological Meeting, Austin, TX (oral)
24. **Yunsoo Choi**, High NO_x emissions bias of the EPA NEI2005: two case studies over Los Angeles and Houston, October 2012, Community Modeling and Analysis meeting, Chapel Hill, NC (oral)

25. **Yunsoo Choi**, Rick Saylor, Ariel Stein, Pius Lee, and Hyuncheol Kim, Use of a satellite indicator of ozone production sensitivities to diagnose model bias, December 2011, American Geophysical Union Meeting, San Francisco, CA (oral)
26. **Yunsoo Choi**, Hyuncheol Kim, Daniel Tong, and Pius Lee, Weekly cycles of observed and modeled NO_x and O₃ concentrations as a function of land use type and ozone production sensitivity of the US, December 2011, American Geophysical Union Meeting, San Francisco, CA
27. **Yunsoo Choi**, Rick Saylor, Ariel Stein, Pius Lee, Hyuncheol Kim, Daniel Tong, Yunhee Kim, Youhua Tang, Jeff McQueen, Ivanka Stajner, Use of a satellite-based indicator of ozone production sensitivities to diagnose model bias, October 2011, Community Modeling and Analysis meeting, UNC, Chapel Hill, NC.
28. **Yunsoo Choi**, Hyuncheol Kim, Daniel Tong, Pius Lee, Rick Saylor, Ariel Stein, Fantine Ngan, Yunhee Kim, Jeff McQueen, Ivanka Stajner, Weekly cycles of observed and modeled NO_x and O₃ concentrations as a function of land use type and ozone production sensitivity, October 2011, Community Modeling and Analysis meeting, UNC, Chapel Hill, NC (oral).
29. **Choi, Y.**, Byun, D., Lee, P., Saylor, R., Stein, A., Tong, D., Kim, H., Ngan, F., Chai, T., Tsidulko, M., and Stajner, I., Evaluation of Modeled Ozone Biases using satellite data and surface measurements, October 2010, Community Modeling and Analysis meeting, UNC, Chapel Hill (oral).
30. **Choi, Y.**, Eldering, A., Osterman, G., Byun, D., Kim, J., and Song, C., The change of tropospheric O₃, its radiative impact, and surface O₃ over the US during the North American Monsoon: Perspective from the space, The 3rd Asia Pacific radiation Symposium, August, 26, 2010, Yonsei University, Seoul, Korea (oral).
31. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., Cunnold, D., Yang, Q., Bucsela, E., Pickering, K., Kim, J., Yung Y., Gu, Y., Liou, K.N., TES team, MLS, team, OMI team, and NOAA-16 satellite team, Perspective on atmospheric chemistry over North America and western Atlantic during the summertime using satellite remote sensing data: Cloud convection and lightning, February 2009, NASA Tropospheric Emission Spectrometer science meeting (oral), Colorado.
32. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., Cunnold, D., Yang, Q., Bucsela, E., and Pickering, K., Lightning and anthropogenic NO_x sources over the U.S. and the western North Atlantic Ocean: Impact on tropospheric O₃ from space-borne observations, January 2009, American Meteorological Society Annual Meeting (oral).
33. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., and Edgerton, E., Understanding enhancements in tropospheric CO from biogenic VOC emissions using TES and MOPITT data, January 2009, American Meteorological Society Annual Meeting (oral).

34. **Choi, Y.**, Kim, J., Eldering, A., Osterman, G., Yung, Y., and Liou, K.N., Lightning and anthropogenic NO_x sources over the U.S. and the western North Atlantic Ocean: Impact on radiative forcing and OLR from space-borne observations, January 2009, American Meteorological Society Annual Meeting.
35. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., Cunnold, D., Yang, Q., Bucsela, E., and Pickering, K., Lightning and anthropogenic NO_x sources over the U.S. and the western North Atlantic Ocean: Impact on tropospheric O₃ from space-borne observations, December 2008, American Geophysical Union Meeting (oral).
36. Kim, J., **Choi, Y.**, Eldering, A., Osterman, G., Yung, Y., and Liou, K.N., Lightning and anthropogenic NO_x sources over the U.S. and the western North Atlantic Ocean: Impact on radiative forcing and OLR from space-borne observations, December 2008, American Geophysical Union Fall Meeting.
37. Osterman, G., Kim, J., **Choi, Y.**, and Eldering, A., Using satellite data for evaluating the coupled WRF-CMAQ modeling system for use in studying the impact of climate change on air quality in the western United States, December 2008, American Geophysical Union Fall Meeting.
38. Wang, Y., Zhao, C., Yang, Q., Fu, R., and **Choi, Y.**, Impacts of East Asian summer monsoon on air quality over China, December 2008, American Geophysical Union Fall Meeting.
39. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., Cunnold, D., Yang, Q., Bucsela, E., Pickering, K., Kim, J., Yung, Y., Gu, Y., Liou, K.N., OMI team, TES team and MLS team, Impact of lightning and anthropogenic NO_x sources on tropospheric O₃ and radiative forcing over the U.S. and the western North Atlantic, October 2008, NASA Aura Science Meeting (oral).
40. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., Kim, J., Yang, Q., Cunnold, D., Edgerton, E., Bucsela, E., and Pickering, K., Lower and upper tropospheric enhancements in O₃ and its precursors from space-borne observations, October 2008, International Global Atmospheric Chemistry Meeting.
41. **Choi, Y.**, Eldering, A., Osterman, G., Wang, Y., and Edgerton, E., Understanding enhancements in tropospheric CO from biogenic VOC emissions using TES and MOPITT data, May 2008, American Geophysical Union Spring Meeting (oral).
42. Yang, Q., Cunnold, D., **Choi, Y.**, and Wang, Y., The study of tropospheric ozone column enhancements over North America using a regional model and the current versions of the Aura satellite data, May 2008, American Geophysical Union Spring Meeting.
43. Wang, Y., **Choi, Y.**, Yang, Q., Cunnold, D., Zeng, T., Shim, C., Lau, M., Eldering, A., Bucsela, E., Gleason, J., Spring to summer northward migration of high O₃ over the western North Atlantic, May 2008, American Geophysical Union Spring Meeting.

44. Zhao, C., Wang, Y., Zeng, T., and **Choi, Y.**, Modeling the impacts of convective transport and lightning NO_x production over North America: Dependence on cumulus parameterizations, December 2007, American Geophysical Union Fall Meeting.
45. **Choi, Y.**, Wang, Y., Yang, Q., Cunnold, D., Zeng, T., Shim, C., Luo, M., Eldering, A., Bucsela, E., and Gleason, J., Spring to summer northward migration of high O₃ over the western North Atlantic, 2007, EOS Aura meeting (oral)
46. Guillas, S., Lefton, L., **Choi, Y.**, and Wang, Y., Calibration of an Air Quality Model, 2007, Joint Statistical Meeting (JSM).
47. **Choi, Y.**, Wang, Y., Zeng, T., Cunnold, D., Yang, E., Martin, R. V. and Chance, K., Modeling analysis of springtime transitions of O₃, NO_x, and CO over North America on the basis of in situ and satellite measurements, December 2006, American Geophysical Union Fall Meeting.
48. Wang, Y., T. Zeng, and **Y. Choi**, Boundary layer structure in the polar atmosphere: Its effects on halogen chemistry in the Arctic spring and snow NO_x emissions in Antarctic spring, 2006, Joint CACGP/IGAP/WMO Symposium.
49. Guillas, S., J. Bao, **Y. Choi** and Y. Wang, Evaluation of the RAQAST Model, Statistical Correction and Downscaling of Ozone Forecasts Over Atlanta, 2006, Multivariate Methods in Environmetrics.
50. Wang, Y., **Y. Choi**, and T. Zeng, Regional chemical weather over the United States: Forecast, simulation evaluations, and dependence on meteorology, 2006, Joint CACGP/IGAC/WMO Symposium.
51. Wang, Y., **Y. Choi**, and T. Zeng, Regional Air Quality Forecast (RAQAST) system: operational forecast and evaluations with satellite measurements, 2006, SPIE Optics & Photonics Conference.
52. Wang, Y., Zeng, T. and **Choi, Y.**, Applications of a regional chemical transport modeling system: Operational air quality forecast, Arctic spring near-surface ozone depletion, and continental outflow from North America, January 2006, American Meteorological Society Forum.
53. **Choi, Y.**, Wang, Y., Zeng, T., Cunnold, D., Yang, E., Martin, R. V. and Chance, K., Modeling analysis of springtime transition of NO₂, CO, and O₃ on the basis of satellite measurements, December 2005, American Geophysical Union Fall Meeting.
54. Jing, P., Cunnold, D., Wang, Y. and **Choi, Y.**, Summertime Tropospheric Ozone Residuals Derived from OMI/MLS Measurement and their Comparison with Regional Air Quality Forecast (RAQAST) Model Results Over the United States, December 2005, American Geophysical Union Fall Meeting.

55. Wang, Y., **Choi, Y.** and Zeng, T., Late-spring Increase of TransPacific Pollution Transport in the Upper Troposphere, December 2005, American Geophysical Union Fall Meeting.
56. **Choi, Y.**, Yoshida, Y., Zeng, T and Wang, Y., Regional Air Quality forecAST (RAQAST) Over the U.S., December 2005, American Geophysical Union Fall Meeting.
57. Y. Wang, T. Zeng, **Y. Choi**, C. Shim, K. Chance, R. Martin, and P. Palmer, Modeling applications of satellite tropospheric chemical measurements: Arctic surface ozone depletion, midlatitude lightning and convective outflow, and global biogenic isoprene, 2005, Gordon Research Conference.
58. **Choi, Y.**, Wang, Y., Zeng, T., Martin, R. V., Kurosu, T. P. and Chance, K., Evidence of Lightning NO_x and Convective Transport of Pollutants in Satellite Observations Over North America, December 2004, American Geophysical Union Fall Meeting.
59. Wang, Y., **Choi, Y.** and Zeng, T., Interannual variability of surface NO_x at the South Pole, 2004, AGU fall meeting. Choi, Y., Y. Wang, R. Martin, T. Kuroso and K, Chance, Active continental outflow of reactive nitrogen, CO, and O₃ from North America during spring, Quadrennial Ozone Symposium, 2004, the International Ozone Commission (IOC) and the European Commission.
60. Shim, C., Wang, Y., **Choi, Y.**, Palmer, P. I., Abbot, D. S., Chance, K., Constraining Global Isoprene Emissions with GOME Formaldehyde Column Measurements, December 2004, American Geophysical Union Fall Meeting.
61. Wang, Y., **Choi, Y.**, Zeng, T. and Martin, V., Operational regional air quality forecast over the U. S., December 2003, American Geophysical Union Fall Meeting.
62. Simpson, I. J., **Choi, Y.**, Blake, D. R. and Rowland, F. S., A Principal Component Analysis of TRACE-P Whole Air Data (Nonmethane Hydrocarbons, Halocarbons, Alkyl Nitrates and Sulfur compounds), December 2002, American Geophysical Union Fall Meeting.

f. **Award and Accomplishments:**

1. Glen Cass Award - April 2007
2. Achievement Award from Earth Resources Technology, December 30, 2010
3. American Geophysical Union journal highlights - 13 February 2006 : Air from Asia pollutes North America's upper troposphere: Yuhang Wang (Ph.D. advisor), Yunsoo Choi, Tao Zeng, Brian Ridley, Nicholas Blake, Donald Blake and Frank Flocke, Late-spring increase of trans-Pacific pollution transport in the upper troposphere, 2006, Geophysical Research Letters, 33, L01811
4. Developed and evaluated 3D Regional chEmical trAnspOrt Model (REAM) over North America using remote sensing products (Georgia Institute of Technology and California

Institute of Technology): with Yuhang Wang (Ph.D. advisor), Tao Zeng (with a colleague), and with Annmarie Eldering (postdoc supervisor): August 2002 – July 2007

5. Developed Regional Air Quality forecAST (RAQAST, at Georgia Institute of Technology): with Yuhang Wang (Ph.D. supervisor) and Tao Zeng (with a colleague): August 2002 – July 2007
6. Developed and evaluated 0D, 1D, and 3D regional chemical transport model over the remote region, Antarctica (at Georgia Institute of Technology): with Yuhang Wang (with Ph.D. advisor) and Tao Zeng (with a colleague): August 2002 – July 2007
7. Implemented radiative transfer model into regional chemical transport model over North America (at California Institute of Technology, Jet Propulsion Laboratory): with Jinwon Kim (with a colleague) and Annmarie Eldering (with a postdoc advisor): August 2007 – February 2010
8. Setup and evaluated 3D regional chemical transport model over Asia (at the California Institute of Technology): August 2007 – February 2010
9. Maintained and updated the National Air Quality Forecasting Capability (NAQFC) system (at the NOAA Air Resources Laboratory) with Daewon Byun (the group lead): February 2010 – April 2012
10. Developed UH Air Quality Forecasting of ozone and PM over Southeast Texas: June 2013 - Present (<http://spock.geosc.uh.edu>)
11. Developed UH Air Quality Forecasting system over the US: October 2013 - Present (<http://spock.geosc.uh.edu>)

g. **Research Service**

- Editorial Board of Scientific Reports – Nature
- Editor of Asia-Pacific Journal of Atmospheric Sciences
- Editorial Board of Journal of Earth Science
- Review of Atmospheric Chemistry and Physics
- Review of Atmospheric Environment
- Reviewer of Journal of Atmospheric Chemistry
- Reviewer of Journal of Geophysical Research
- Reviewer of Geophysical Research Letters
- Reviewer of Asia-Pacific Journal of Atmospheric Sciences

h. **Books and Technical Reports**

1. Han, J., Hong, Y., Chang, I., Lee, D., Yoo, J., Hong, S., Son, J., Choi, J., Kim, B., Kim, Y., Kim, H., Chang, M., **Choi, Y.**, Heo, K., Korean-American Air Pollution Forecasting Workshop, May 2014, NIER-GP2014-046
2. **Choi, Y.** and Czader, B., Impact of uncertainties in NO₂ and HONO emissions and chemistry on radicals and ozone in southeast Texas, July 2015, final report submitted to the Texas Air Research Center (TARC)

3. **Choi, Y.**, Li, X., Souril, A.H., Diao, L., Roy, A., and Pan, S., Constraining NO_x emissions using satellite NO₂ column measurements over the Southeast Texas, September 2015, final report submitted to the Air Quality Research Program (AQRP), http://aqrp.ceer.utexas.edu/viewprojectsFY14-15.cfm?Prop_Num=14-014
4. **Choi, Y.**, Development and Evaluation of a Hybrid Eulerian-Lagrangian air quality model for simulating large air pollution events, November 2015, Final report to National Institute of Environmental Research
5. Eick, C., **Choi, Y.**, Gnawali, O., and Shi, W., Network and Computational Infrastructure for collecting and interpreting sensor data with respect to aerosolized chemical and biological threats, July 2015, the final report to the Department of Homeland Security
6. **Choi, Y.** et al., Development and Evaluation of a Hybrid Eulerian-Lagrangian air quality model for simulating large air pollution events, December 2015, final report submitted to the National Institute of Environmental Research (NIER)
7. **Choi, Y.** et al., CMAQ Modeling Archive for Exceptional Events Analyses, September 2016, final report submitted to the Texas Commission on Environmental Quality (TCEQ)**Choi, Y.**, Czader, B., Li, X., Kim, H., Diao, L., and Rodriguez, J., Development of chemistry and transport modules in numerical weather prediction, December 16 2013, final report submitted to the Korea Institute of Atmospheric Prediction System (KIAPS) (as a leading author)
8. **Choi, Y.** and Czader, B., Impact of uncertainties in NO₂ and HONO emissions and chemistry on radicals and ozone in southeast Texas, September 11 2014, interim report submitted to the Texas Air Research Center/Lamar University (as a leading author)