Yunsoo Choi

Department of Earth & Atmospheric Sciences
University of Houston
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Areas of Expertise

Atmospheric Chemistry, Air quality modeling, Regional chemical transport modeling, Satellite remote sensing

Academic and Research Positions

Assistant Professor (September 2012 – Present) University of Houston, Department of Earth and Atmospheric Sciences, Houston, TX

Leading Chemical Transport Modeling (CTM) Group at University of Houston

Research Scientist (April 2012 – August 2012) SSAI, NASA GSFC, US Aura OMI Science Team, Greenbelt, MD

Evaluated OMI satellite NO_2 and SO_2 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

Science Team Member (Atmospheric Modeler) (February 2010–Present), Remote Sensing, Tropospheric Emission Spectrometer Project, http://tes.jpl.nasa.gov/team/scienceteam/

Supporting the scientific activity of the satellite TES project

Science Advisory Committee Member, Geostationary Environment Monitoring Spectrometer (GEMS), November 2009 – Present

Advising the scientific activity of geostationary satellite project, GEMS

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, 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)

Publications (pre-reviewed journals):

Yunsoo Choi, Hyuncheol Kim, Daniel Tong, and Pius Lee, Summertime weekly cycles of observed and modeled NOx 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

Yunsoo Choi, Hyuncheol Kim, Daniel Tong, and Pius Lee, Summertime weekly cycles of observed and modeled NO_x and O_3 concentrations as a function of land use type and ozone production sensitivity over the Continental United States, 2012, Atmospheric Chemistry and Physics Discussion, 12, 1585-1611

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.

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.

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.

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.

Chun Zhao, Yuhang Wang, Yunsoo Choi, and Tao Zeng, Summertime impacts of convective transport and lightning NOX production over North America: modeling dependence on meteorological simulations, 2009, Atmospheric Chemistry and Physics, 9, 4315-4327.

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.

Yunsoo Choi, Yuhang Wang, Tao Zeng, Derek Cunnold, Eun-Su Yang, Randall Martin, and Kelly Chance, Valerie Thouret, and Eric Edgerton, Springtime transition of NO_2, CO, and O_3 over North America: Model evaluation and analysis, 2008, Journal of Geophysical Research, 113, D20311, doi:10.1029/2007JD009632.

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.

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.

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.

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.

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.

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.

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.

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 O_3 at northern middle and high latitudes, 2003, Journal of Geophysical Research, 108(D21), 4683.

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.

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.

Invited talks:

Choi, Y., et al., Air Quality Forecasting system and its application, March 26, 2013, Southeast Texas Photochemical Modeling Technical Committee Meeting, Houston-Galveston Area Council, Houston, TX

Choi, Y. et al., Human and Lightning tropospheric/surface O_3 & UH air quality and climate forecasting system, March 1, 2013, Texas Commission on Environmental Quality, Austin, TX

Chio, Y. et al., Human and Lightning contribution to tropospheric O_3: The view from Space, January 18, 2013, Lecture series of Civil and Environmental Engineering, Rice University, Houston, TX

Choi, Y., et al., The human and lightning contribution to tropospheric O_3 and surface O_3 sensitivity over chemical regimes: view from space to ground, March 26, 2012, University of Houston, Houston, TX

Choi, Y., et al., Summertime National Air Quality Forecasting Capability (NAQFC) O_3 predictions overt the United States, October 6, 2011, NOAA Air Resources Laboratory, Silver Springs, MD

Choi, Y., et al., 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

Choi, Y., et al., Weather and Remote Sensing on Air Quality Forecasting, April, 22, 2011, Korean-American Scientist and Engineer Association (KSEA) Southeastern Regional Conference 2011, Atlanta, Georgia.

Choi, Y., et al., VOC/NOx 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.

Choi, Y., et al., Lightning and anthropogenic NO_x sources over the US and the Atlantic: Impact on tropospheric O_3 and radiative effects, Oct, 2009, California State University at Fullerton, Fullerton, California.

Choi, Y., et al., 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.

Choi, Y., et al., Enhancements in tropospheric CO over North America and the western Atlantic Ocean observed by TES and MOPITT: Biogenic and anthropogenic sources, Feb, 2009, NCAR, Boulder, Colorado.

Choi, Y., et al., Remote sensing based atmospheric chemistry perspective on summertime features: Summer' heat and cloud convection with lightning, 2009, April, ACDR seminar, JPL, Pasadena, California.

Choi, Y., et al., Upper and lower tropospheric perturbations on O_3 and its precursors from space: Lightning NO_X and biogenic-derived CO, 2008, Yuk L. Yung lunch seminar, California Institute of Technology, Pasadena, California.

Choi, Y., et al., Tropospheric perturbations on O_3 and its precursors from remote sensing measurements, June, 2008, Yonsei University, Seoul, Korea.

Choi, Y., et al., Modeling analysis of lightning NO_X production and biogenic VOC emissions in the troposphere from space-borne measurements, June, 2008, Hanyang University, Seoul, Korea.

Choi, Y., et al., Modeling analysis of upper and lower tropospheric perturbations on O_3 and its precursors in the troposphere: Enhanced lightning activity and high surface temperature, June, 2008, Seoul National University, Seoul, Korea.

Choi, Y., et al., Upper and lower tropospheric enhancements of O_3 and its precursors in the troposphere: Lightning NO_X production and biogenic VOC emissions, June, 2008, Busan National University, Busan, Korea.

Choi, Y., et al., Convection and surface temperature derived upper and lower tropospheric perturbations on O_3 and its precursors, June, 2008, Kwangju Institute of Technology, Kwangju, Korea.

Choi, Y., et al., NO_2, CO, and O_3 over North America on the basis of in situ and satellite measurements, February, 2007, Jet Propulsion Laboratory, Pasadena, California.

Presentations:

Yunsoo Choi, NOx emissions uncertainty of the EPA NEI 2005 over the Southern US, AMS meeting, 2013, Austin, TX (oral)

Yunsoo Choi, High NOx emissions bias of the EPA NEI2005: two case studies over Los Angeles and Houston, CMAS meeting, 2012, Chapel Hill, NC (oral)
Yunsoo Choi, Rick Saylor, Ariel Stein, Pius Lee, and Hyuncheol Kim, Use of a satellite indicator of ozone production sensitivities to diagnose model bias, AGU fall meeting, December, 2011, San Francisco, CA (oral)

Yunsoo Choi, Hyuncheol Kim, Daniel Tong, and Pius Lee, Weekly cycles of observed and modeled NO_x and O_3 concentrations as a function of land use type and ozone production sensitivity of the US, AGU fall meeting, December 2011, San Francisco, CA

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, CMAS meeting, October 24, 2011, UNC, Chapel Hill, NC.

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 O_3 concentrations as a function of land use type and ozone production sensitivity, CMAS meeting, October 26, 2011, UNC, Chapel Hill, NC (oral).

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, CMAS meeting, October 12, 2010, UNC, Chapel Hill (oral).

Choi, Y., Eldering, A., Osterman, G., Byun, D., Kim, J., and Song, C., The change of tropospheric O_3, its radiative impact, and surface O_3 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).

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, 2009, TES science meeting (oral), Colorado.

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: Impacton tropospheric O_3 from space-borne observations, 2009, AMS annual meeting (oral).

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, 2009, AMS annual meeting (oral).

Choi, Y., Kim, J., Eldering, A., Osterman, G., Yung, Y., and Liou, K.N., Lightning and anthropogenic NOx sources over the U.S. and the western North Atlantic Ocean: Impact on radiative forcing and OLR from space-borne observagtions, 2009, AMS annual meeting.

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 O_3 from space-borne observations, 2008, AGU fall meeting (oral).

Kim, J., Choi, Y., Eldering, A., Osterman, G., Yung, Y., and Liou, K.N., Lightning and anthropogenic NOx sources over the U.S. and the western North Atlantic Ocean: Impact on radiative forcing and OLR from space-borne observations, 2008, AGU fall meeting.

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, 2008, AGU fall meeting.

Wang, Y., Zhao, C., Yang, Q., Fu, R., and Choi, Y., Impacts of East Asian summer monsoon on air quality over China, 2008, AGU fall meeting.

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 O_3 and radiative forcing over the U.S. and the western North Atlantic, 2008, Aura Science Meeting (oral).

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 O_3 and its precursors from space-borne observations, 2008, IGAC meeting.

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, 2008, AGU spring meeting (oral).
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, 2008, AGU spring Meeting.

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 O_3 over the western North Atlantic, 2008, AGU spring meeting.

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 paramterizations, 2007, AGU fall meeting.

Choi, Y., Wang, Y., Yang, Q., Cunnold, D., Zeng, T., Shim, C., Luo, M., Eldering, A., Bucsela, E., and Gleson, J., Spring to summer northward migration of high O_3 over the western North Atlantic, 2007, EOS Aura meeting (oral)

Guillas, S., Lefton, L., Choi, Y., and Wang, Y., Calibration of an Air Quality Model, 2007, Joint Statistical Meeting (JSM).

Choi, Y., Wang, Y., Zeng, T., Cunnold, D., Yang, E., Martin, R. V. and Chance, K, Modeling analysis of springtime transitions of O_3, NO_X, and CO over North America on the basis of in situ and satellite measurements, 2006, AGU fall meeting.

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.

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.

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.

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.

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, 2006, AMS Forum.

Choi, Y., Wang, Y., Zeng, T., Cunnold, D., Yang, E., Martin, R. V. and Chance, K., Modeling analysis of springtime transition of NO_2, CO and O_3 on the basis of satellite measurements, 2005, AGU fall meeting.

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, 2005, AGU fall meeting.

Wang, Y., Choi, Y. and Zeng, T., Late-spring Increase of TransPacific Pollution Transport in the Upper Troposphere, 2005, AGU fall meeting.

Choi, Y., Yoshida, Y., Zeng, T and Wang, Y., Regional Air Quaility forecAST (RAQAST) Over the U.S., 2005, AGU fall meeting.

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.

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, 2004, AGU fall meeting.

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 O_3 from North America during spring, Quadrennial Ozone Symposium, 2004, the International Ozone Commission (IOC) and the European Commission.

Shim, C., Wang, Y., Choi, Y., Palmer, P. I., Abbot, D. S., Chance, K., Constraining Global Isoprene Emissions with GOME Formaldehyde Column Measurements, 2004, AGU fall meeting.

Wang, Y., Choi, Y., Zeng, T. and Martin, V., Operational regional air quality forecast over the U. S., 2003, AGU fall meeting.

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), 2002, AGU fall Meeting.

Choi, Y. and Y. Won, Molecular Dynamics Simulations of BPTI in Aqueous and Organic Solvents, 1995, 74rd annual meeting of the Korean Chemical Society.

Choi, Y. and Y. Won, Molecular Dynamics Simulations of Polymer Chain Folding, 1994, Gordon Research Conference on Computational Chemistry.

Choi, Y. and Y. Won, Molecular Dynamics Simulations of Polymer Chain Folding, 1994, 73rd annual meeting of the Korean Chemical Society.

Award and Accomplishments:

- Glen Cass Award - April 2007

- Certificate of Appreciation from Earth Resources Technology, December 30, 2010

- AGU 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, Nicolar Blake, Donald Blake and Frank Flocke, Late-spring increase of trans-Paciffic pollution transport in the upper troposphere, 2006, Geophysical Research Letters, 33, L01811

- 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)

- Developed Regional Air Quality forecAST (RAQAST, at Georgia Institute of Technology): with Yuhang Wang (Ph.D. supervisor) and Tao Zeng (with a colleague)

- 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)

- 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)

- Setup and evaluated 3D regional chemical transport model over Asia (at the California Institute of Technology)

- Maintained and updated the National Air Quality Forecasting Capability (NAQFC) system (at the NOAA Air Resources Laboratory) with Daewon Byun (the group lead)

Professional Societies:

American Geophysical Union (AGU)
American Meteorological Society (AMS)

A reviewer of Journal of Atmospheric Chemistry
A reviewer of Journal of Geophysical Research
A reviewer of Geophysical Research Letters