



Kazuyuki Miyazaki

NASA Jet Propulsion Laboratory

My research

Kazuyuki Miyazaki is a scientist who specializes in atmospheric composition research. His research activities range from the development of chemical data assimilation system to the study of the impact of air quality on climate and human health. His chemical reanalysis product, based on assimilation of multiple satellite measurements from various NASA missions, has provided unique information on decadal changes in the atmospheric environment for various air quality and climate studies. He is a PI of the NASA Aura Science team and JPL Science Understanding from Data Science projects. His current research includes observing system simulation experiments (OSSEs), evaluations of satellite data products and IPCC model predictions, and air quality and GHG emission analysis.

contact



+1 (818) 354-3266



kazuyuki.miyazaki@jpl.nasa.gov



4800 Oak Grove Drive,
MS 233-200, Pasadena,



<https://science.jpl.nasa.gov/people/Miyazaki/>

EDUCATION

Ph.D. in Geophysics, 2006
Tohoku University, Japan

Focus: Atmospheric Sciences

Professional Experience

	<i>University of California, Los Angeles</i>
2022 - Present	Visiting Project Scientist , Joint Institute for Regional Earth System Science and Engineering (JIFRESSE)
	<i>Jet Propulsion Laboratory, California Institute of Technology</i>
2019 - Present	Scientist , Tropospheric Composition Group
2016 - 2017	Research Scholar , Carbon Cycle and Ecosystems Group
	<i>Japan Agency for Marine-Earth Science and Technology (JAMSTEC)</i>
2019 - Present	Visiting Senior Scientist , Geochemical Cycle Research Group
2017 - 2019	Deputy Group Leader , Geochemical Cycle Research Group
2013 - 2019	Senior Scientist (tenured) , Research and Development Center for Global Change
2011 - 2012	Research Scientist , Environmental Biogeochemical Cycle Research Program
2006 - 2010	Postdoctoral Scientist , Frontier Research Center for Global Change
	<i>University of Hawai'i</i>
2012 - 2013	Visiting Scientist , International Pacific Research Center (IPRC)
	<i>Royal Netherlands Meteorological Institute (KNMI)</i>
2010 - 2012	Visiting Scientist , Chemistry and Climate Division
	<i>The Japan Society for the Promotion of Science for Young Scientists (JSPS)</i>
2003 - 2006	Research Fellow , Category DC1: for excellent Ph.D. students

Professional Activities

2022 – present	SOC , WMO workshop on the Impact of Various Observing Systems on NWP and Earth System Prediction
2022 – present	Team member , The Joint Center for Satellite Data Assimilation (JCSDA) AOP2022
2022 - present	Science team member , GOSAT-GW project
2021 - present	Working group lead , IGAC, Tropospheric Ozone Assessment Report, Phase II (TOAR-II, 2020-2024), Chemical Reanalysis Focus working group
2021 - present	Validation team member , GEMS L1/L2 validation team
2020	Workshop member , COVID-19: Identifying Unique Opportunities for Earth System Science, Caltech KISS Virtual Workshop
2020	Panelist , the EPA’s webinar “Moving from research to regular utilization of satellite data: NO ₂ and O ₃ ” (2020)
2020	Workshop organizer , AMIGO/IGAC VIRTUAL WORKSHOP, CHANGES IN ATMOSPHERIC COMPOSITION DURING THE COVID-19 LOCKDOWNS
2020	Session Chair , AGU fall meeting 2020 “Satellite-Based Air Quality and Atmospheric Composition Impacts of COVID-19”
2019 - present	Steering members , IGAC (International Global Atmospheric Chemistry), AMIGO (Analysis of eMissions usinG Observations)
2019 - present	Science Advisory Group member , the ESA Mission ESP-MACCS
2018 - present	Review Panel , NASA, ESA, EFG grant proposals
2015	Review Panel , Wageningen University graduate school evaluation panel
2015 - 2019	Committee member , the IGPB/WCRP/DIVERSITAS subcommittee, <i>Science Council of Japan</i>
2013 - 2017	Expert investigator , National Institute of Science and Technology Policy, <i>Ministry of Education, Culture, Sports, Science and Technology, Japan</i>

Awards

2022	NASA Exceptional Scientific Achievement Medal
2020	NASA group achievement award for MUSES algorithm team
2020	JPL team bonus award for COVID-19 air quality research
2017	NASA group achievement award to KORUS-AQ team
2012	Yamamoto-Shono Award (best young scientist award) from the Meteorological Society of Japan
2009	Young Scientist Award from the Japan Society of Atmospheric Chemistry
2009	JAMSTEC award for Outstanding Research Accomplishments
2004	Best poster award, 5th International Workshop on Global Change: Connection to the Arctic (GCCA5)
2004 - 2006	Half exemption of the school fee at Tohoku University
1999 - 2003	Japanese Government Scholarship, Ministry of Education, Culture, Sports, Science and Technology

Mentor / Teaching experience

2022	Mentor , Joanna Li, 2022 UCLA Student Research Program (SRP) Mentor , Machenzie Arnold, 2022 UCLA Student Research Program Mentor , Joanna Li, 2022 JIFRESSE Summer Internship Program (JSIP) Mentor , Oscar Neya, 2022 UCLA Strategic University Research Partnerships (SURP) Program Co-Mentor , Eshani Patel, 2022 Caltech SURF Internship Program (JSIP)
2021	Mentor , Madelyn Romberg, 2021 JIFRESSE Summer Internship Program (JSIP) & JPL Visiting Student Research Program (JVSRP)
2020 - present	Co-mentor , Jiani Yang, Caltech graduate student
2020 - present	Mentor , Oscar Neya, UCLA graduate student intern
2019	Mentor , Nadia Columbi, summertime intern student (UCLA)
2016 - 2020	Mentor , Takashi Sekiya, postdoctoral scientist (JAMSTEC)

2016 - 2019	Co-supervisor , Dai Koshin, PhD course student (University of Tokyo)
2015 - 2016	Co-supervisor , PhD course student (Tohoku University)
2013	Part-time Lecturer , Ibaraki University
2009 - 2010	Co-supervisor , master's candidate (Hokkaido University)
2003 – 2006	Technical assistance , Supercomputing System Information Synergy Center, Tohoku University
2003 - 2004	Research Assistant , Tohoku University

Funding

NASA and JPL proposals funded as PI

- **PI**, New satellite-based products of global fossil fuel CO₂ emissions from JAXA's GOSAT-GW, JPL Researchers on Campus (JROC) Program, NASA ROSES Earth Science U.S. Participating Investigator (FY2022-2027)
- **PI**, Impact of COVID-19 on radiative forcing from short-lived climate pollutants (SLCPs) informed by satellites, modeling, and assimilation, JPL Researchers on Campus (JROC) Program, (FY2023)
- **PI**, Studying 2020 western US mega-fires using carbon monoxide from satellites, models, and reanalysis, JPL Strategic University Research Partnership (SURP), (FY2023-2025)
- **PI**, Sub-grid Scale Drivers of Pollution Inferred from Model-based Inference and Machine Learning, JIFRESSE Summer Internship Program (JSIP), (FY2022)
- **PI**, *Subgrid Scale Drivers of Pollution Inferred from Model-Based Inference and Machine Learning*, JPL Strategic research and technology development (SRTD), (FY2022-2024)
- **PI**, JPL Earth Science Division Raise the Bar (2020-2023)
- **PI**, *Quantifying the impacts of global shifts of anthropogenic emissions on air quality using a decadal chemical reanalysis based on the Aura and A-train satellite measurements*, NASA ROSES Aura Science team NNH19ZDA001N-AURAST (2020–2023)

NASA and JPL proposals funded as Co-I

- **Co-I**, *STRATOS*, JPL Strategic research and technology development (SRTD), (FY2022-2024)
- **Co-I**, *Ozone and Trace Gases*, JPL Strategic research and technology development (SRTD), (FY2022-2024)
- **Co-I**, *Air Quality Architecture to Meet US National Needs for Forecasting, Management, and Assessment of Health Impacts*, JPL Strategic research and technology development (SRTD), (FY2022-2024)
- **Co-I**, A scalable framework for assessing variability in CO₂ point sources using multiple satellite instruments, NASA ROSES 2020: Science Team for the OCO Missions NNH20ZDA001N-OCOST (2021-2014) (PI: Daniel Cusworth)

Other funded proposals

- **Co-I**, *Quantifying Trends in Top-down Emission Estimates of CO and NO_x*, CSA Class Grant and Contribution Program (2021-2024) (PI: Dylan Jones)
- **PI**, *TROPOMI multi-constituent data assimilation*, Fund for the Promotion of Joint International Research (Fostering Joint International Research (B)), 18KK0102 (2018–2019)
- **PI**, *Tropospheric chemistry reanalysis: TCR-2*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (B)18H01285D (2018–)
- **PI**, *Multi-constituent chemical data assimilation*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (C) 15K05296 (2015–2017)
- **PI**, *Assimilation of multiple chemical satellite observations and emission estimations*, Japan Society for the Promotion of Science Grant-in-Aid for Yong Scientists (B) 19740300 (2012–2014)
- **PI**, *Global chemical data assimilation of OMI NO₂ data*, JSPS Postdoctoral Fellowship for Research Abroad (2010–2012)
- **PI**, *Development of a data assimilation system for ozone and related species using an ensemble Kalman filter*, Japan Society for the Promotion of Science Grant-in-Aid for Yong Scientists (B) 19740300 (2006–2009)
- **PI**, WMO/WCRP financial assistance for the Earth System Science Partnership (ESSP), Global Environmental Change Open Science Conference (2006)
- **PI**, Financial assistance for the carbon data assimilation workshop from the Mathematical Sciences Research Institute, University of California Berkeley (2006)

- **PI**, WMO/WCRP financial assistance for SPARC data assimilation workshop (2005)
- **PI**, Travel grant from the Tohoku development foundation (2005)
- **PI**, Grant-in-Aid for Fellows of the Japan Society for the Promotion of Science (2003–2006)
- **Collaborator**, A scalable framework for assessing variability in CO₂ point sources using multiple satellite instruments, NASA ROSES NNH20ZDA001N-OCOST (2021-2023)
- **CoI**, Substantiating Key Synergies Between Air Quality (AQ) and Greenhouse Gas (GHG) Monitoring from Space: A case for anthropogenic CO₂ and CH₄ constraints from CO and NO₂, NNH18ZDA001N, NASA Atmospheric Composition Modeling and Analysis Program (2019–2022)
- **CoI**, *Emission estimates of black carbon and methane*, Global Environment Research Fund (2-1803) by the Ministry of the Environment, Japan (2018–2021)
- **CoI**, *The Role of Anthropogenic Combustion on Urban-Geo System Environments: A Multi-Species Analysis Over Megacities*, NASA Research Announcement, NNH16ZDA001N-ACMAP, Atmospheric Composition: Aura Science Team and Atmospheric Composition Modeling and Analysis Program (PI: Avelino F. Arellano, Jr., University of Arizona) (2017–2019)
- **CoI**, *Development and application of intelligent measurement-analysis methods through coalition between measurement technologies and informatics*, Japan Science and Technology Agency (JST) CREST program (PI: K. Sato) (2016–2022)
- **CoI**, *Tropospheric ozone variations over southeast Asia*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (C) 16K00535 (PI: S. Ogino) (2016–2022)
- **CoI**, *A.19 KORUS-AQ: An International Cooperative Air Quality Field Study in Korea*, NASA Research Announcement (NRA) NNH15ZDA001N, Research Opportunities in Space and Earth Science (ROSES-2015) (PI: L. Emmons) (2016–2018)
- **CoI**, *Big data and Earth sciences*, FLAGSHIP2020 Post-K computer project (PI: K. Takahashi) (2015–2019)
- **CoI**, *Towards km-scale air pollution observations from space*, Coordination Funds for Promoting AeroSpace Utilization (PI: Y. Kanaya) (2015–2017)
- **CoI**, Arctic Challenge for Sustainability (ArCS) Project (PI: T. Koike) (2015–2019)
- **CoI**, *Ientropic analyses of atmospheric/oceanic global circulations*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (A) 15H02129 (PI: T. Iwasaki) (2015–2019)
- **CoI**, *Dynamics and chemistry in the tropical tropopause layer*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (S) 26220101 (PI: F. Hasebe) (2014–2018)
- **CoI**, *Understanding QBO variations in changing climate*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (B) 26287117 (PI: Y. Kawatani) (2014–2016)
- **CoI**, *Understanding CH₄ and N₂O variations from an atmospheric chemistry-land vegetation coupling model*, Japan Society for the Promotion of Science Grant-in-Aid for Scientific Research (B) 25241006 (PI: K. Sudo) (2013–2015)
- **CoI**, *Development of a data assimilation system for ozone and related species using an ensemble Kalman filter*, Global Environment Research Fund (B-93) by the Ministry of the Environment, Japan (PI: T. Iwasaki) (2009–2012)

Selected invited talks

1. **Miyazaki, K.**, Atmospheric composition modeling, data assimilation, and emission estimates using multi-constituent satellite observations. University of California Irvine, Department of Earth System Science Seminar, 16 November 2022
2. **Miyazaki, K.**, Atmospheric composition chemical reanalysis and emission estimates based on multi-constituent satellite data assimilation. Harvard University Atmospheric & Environmental Chemistry Seminar, 1 April 2022 (Virtual)
3. **Miyazaki, K.**, K. Bowman, T. Sekiya, M. Takigawa, J. Neu, K. Sudo, G. Osterman, H. Eskes, Global tropospheric ozone responses to reduced NO_x emissions linked to the COVID-19 world-wide lockdowns, AGU Fall Meeting 2021, 15 December 2021 (Virtual)
4. **Miyazaki, K.**, K. Bowman, T. Sekiya, M. Takigawa, J. Neu, K. Sudo, G. Osterman, H. Eskes, Global tropospheric ozone responses to reduced NO_x emissions linked to the COVID-19 world-wide lockdowns, Caltech Yuk Lunch Seminar, 1 September 2021 (Virtual)

5. **Miyazaki, K.**, K. Bowman, T. Sekiya, M. Takigawa, J. L. Neu, K. Sudo, G. Osterman, H. Eskes, Updated atmospheric composition chemical reanalysis and emission estimates, JpGU Meeting 2021, 2 June 2021. (Virtual)
6. **Miyazaki, K.**, Jones, D., W. Helen, K. Bowman (2021). Assessment of measurement representativeness by chemical reanalyses and TOAR-II chemical reanalysis Focus Working Group plan, IGAC TOAR-II HEGIFTOM working group meeting, 25 March 2021. (Virtual)
7. **Miyazaki, K.**, Bowman, K., Neu, J., Osterman, G., Sekiya, T., Takigawa, M., Eskes, H., Sudo, K. (2021). Quantifying the impacts of global shifts of anthropogenic emissions on air quality using a decadal chemical reanalysis based on multiple NASA's satellite measurements, UCLA JIFRESSE seminar, 26 February 2021. (Virtual)
8. **Miyazaki, K.**, Bowman, K., Sekiya, T., Jiang, Z., Chen, X., Eskes, H., Ru, M., Zhang, Y., Shindell, D., (2020). Quantifying the impacts of global shifts of anthropogenic emissions on air quality using a decadal chemical reanalysis based on multiple NASA's satellite measurements, AGU fall meeting, 8 December 2020. (Virtual)
9. **Miyazaki, K.**, K. W. Bowman, T. Sekiya, D. Fu, S. S. Kulawik, K. Sudo, T. Walker, Y. Kanaya, M. Takigawa, K. Ogochi, H. Eskes, K. F. Boersma, A. M. Thompson, B. Gaubert, J. Barre, and L. K. Emmons, K. Yumimoto Multi-constituent chemical data assimilation and its applications in air quality and climate research, EOS Aura Science Team Meeting, Pasadena, CA, USA, 27 August 2019.
10. **Miyazaki, K.**, T. Sekiya, D. Fu, K. W. Bowman, T. Walker, S. S. Kulawik, K. Sudo, Y. Kanaya, M. Takigawa, K. Ogochi, B. Gaubert, J. Barre, L. Emmons, Applications of satellite, ozonesonde, and aircraft measurements and chemical transport models on air quality research, USTH workshop on Upper Air Sounding and Air Quality, Hanoi, Vietnam, 8 October 2018.
11. **Miyazaki, K.**, T. Sekiya, H. Eskes, F. Boersma, D. Fu, K. Bowman, Susan S. Kulawik, T. Walker, K. Sudo, Y. Kanaya, M. Takigawa, K. Ogochi, B. Gaubert, J. Barre, L. Emmons, A tropospheric chemistry reanalysis based on multi-constituent satellite data assimilation and its application for KORUS-AQ, 2017 annual conference of Korean Society for Atmospheric Environment, Deagu, Republic of Korea, 10 November, 2017.
12. **Miyazaki, K.**, A tropospheric chemistry reanalysis based on multi-constituent satellite data assimilation, University of Toronto Noble seminar series, Toronto, Canada, 3 October 2016.
13. **Miyazaki, K.**, H. Eskes, and K. Sudo, A tropospheric chemistry reanalysis for the years 2005-2014 based on an assimilation of AURA OMI, MLS, TES and MOPITT satellite data, The Moscone Center, San Francisco, AGU fall meeting, 15 December 2015.
14. **Miyazaki, K.**, A tropospheric chemistry reanalysis for the years 2005-2014 based on an assimilation of AURA OMI, MLS, TES and MOPITT satellite data, UC Berkeley BASC Seminar, Berkeley, USA, 18 November 2015.
15. **Miyazaki, K.**, A tropospheric chemistry reanalysis for the years 2005-2014 based on an assimilation of AURA OMI, MLS, TES and MOPITT satellite data, Wageningen University Meteorology and Air Quality seminar, Wageningen, the Netherlands, 10 September 2015.
16. **Miyazaki, K.**, A tropospheric chemistry reanalysis for the years 2005-2012 based on an assimilation of AURA OMI, MLS, TES and MOPITT satellite data, NCAR formal seminar, Boulder, USA, 19 March 2015.
17. **Miyazaki, K.**, Estimating surface NO_x and CO emissions and lightning NO_x sources by assimilating satellite observations of multiple chemical species, Workshop on parameter estimation and inverse modelling for atmospheric composition, ECMWF, Reading, UK, 22 October 2013.
18. **Miyazaki, K.**, Global and Asian NO_x emission estimates derived from a combined assimilation of multiple satellite observations, International Workshop on "Inventory, Modeling and Climate Impacts of Greenhouse Gas emissions (GHG's) and Aerosols in the Asian Region, Tsukuba International Conference Center, Tsukuba, Japan, 26 June 2013.
19. **Miyazaki, K.**, Simultaneous assimilation of multi-species data for the analysis of chemical composition in the troposphere and stratosphere, WCRP Regional Workshop on Stratosphere-Troposphere Processes and their Role in Climate (SPARC), Kyoto University, Kyoto, 1 April 2013.

Publications

[Google scholar](#)

1. Kaoru Sato and Yoshihiro Tomikawa and Masashi Kohma and Ryosuke Yasui and Dai Koshin and Haruka Okui and Shingo Watanabe and **Kazuyuki Miyazaki** and Masaki Tsutsumi and Damian Murphy and Chris Meek and Yufang Tian and Manfred Ern and Gerd Baumgarten and Jorge L. Chau and Xinzhao Chu and Richard L. Collins

- and Patrick Joseph Espy and Hiroyuki Hashiguchi and Andrew John Kavanagh and Ralph Latteck and Franz-Josef Luebken and Marco Milla and Satonori Nozawa and Yasunobu Ogawa and Kazuo Shiokawa and M. Joan Alexander and Takuji Nakamura and William Edmund Ward, Interhemispheric Coupling Study by Observations and Modelling (ICSOM). *Authorea*. December 02, 2022. DOI: [10.1002/essoar.10512968.1](https://doi.org/10.1002/essoar.10512968.1)
2. Okamoto, S., Cuesta, J., Beekmann, M., Dufour, G., Eremenko, M., **Miyazaki, K.**, Bonne, C., Tanimoto, H., and Akimoto, H.: Impact of different sources of precursors on a high-ozone event over Europe analysed with IASI-GOME2 multispectral satellite observations and model simulations, *Atmos. Chem. Phys. Discuss.* [preprint], <https://doi.org/10.5194/acp-2022-764>, in review, 2022.
 3. **Miyazaki, K.**, and K. Bowman, Predictability of fossil fuel CO₂ from air quality emissions, PREPRINT (Version 1) available at Research Square [<https://doi.org/10.21203/rs.3.rs-2019513/v1>]
 4. Malina, E., Bowman, K. W., Kantchev, V., Kuai, L., Kurosu, T. P., **Miyazaki, K.**, Natraj, V., Osterman, G. B., and Thill, M. D.: Joint spectral retrievals of ozone with Suomi NPP CrIS augmented by S5P/TROPOMI, EGUsphere [preprint], <https://doi.org/10.5194/egusphere-2022-774>, 2022.
 5. Shogrin, M. J., Payne, V. H., Kulawik, S. S., **Miyazaki, K.**, and Fischer, E. V.: Measurement Report: Spatiotemporal variability of peroxy acyl nitrates (PANs) over Mexico City from TES and CrIS satellite measurements, *Atmos. Chem. Phys. Discuss.* [preprint], <https://doi.org/10.5194/acp-2022-582>, in review, 2022.
 6. Christian A. DiMaria; Dylan B. A. Jones; Helen M Worden; A. Anthony Bloom; Kevin W. Bowman; Trissevgeni Stavrakou; **K. Miyazaki**; John R. Worden; Alex B. Guenther; Chinmoy Sarker et al., Optimizing the isoprene emission model MEGAN with satellite and ground-based observational constraints, [preprint], <https://doi.org/10.1002/essoar.10512404.1>, in review, 2022.
 7. Bisht, J. S. H., Patra, P. K., Takigawa, M., Sekiya, T., Kanaya, Y., Saitoh, N., and **Miyazaki, K.**: Estimation of CH₄ emission based on advanced 4D-LETKF assimilation system, EGUsphere [preprint], <https://doi.org/10.5194/egusphere-2022-719>, 2022.
 8. He, T.-L., Jones, D. B. A., **Miyazaki, K.**, Bowman, K. W., Jiang, Z., Chen, X., Li, R., Zhang, Y., and Li, K.: Inverse modelling of Chinese NO_x emissions using deep learning: integrating in situ observations with a satellite-based chemical reanalysis, *Atmos. Chem. Phys.*, 22, 14059–14074, <https://doi.org/10.5194/acp-22-14059-2022>, 2022.
 9. **Miyazaki, K.**, J. L. Neu, G. Osterman, K. Bowman, Changes in U.S. background ozone associated with the 2011 turnaround in Chinese NO_x emissions, *Environmental Research Communications*, <https://doi.org/10.1088/2515-7620/ac619b>, 2022.
 10. Sekiya, T., **Miyazaki, K.**, Eskes, H., Sudo, K., Takigawa, M., and Kanaya, Y.: A comparison of the impact of TROPOMI and OMI tropospheric NO₂ on global chemical data assimilation, *Atmos. Meas. Tech.*, 15, 1703–1728, <https://doi.org/10.5194/amt-15-1703-2022>, 2022.
 11. Payne, V. H., Kulawik, S. S., Fischer, E. V., Brewer, J. F., Huey, L. G., **Miyazaki, K.**, Worden, J. R., Bowman, K. W., Hints, E. J., Moore, F., Elkins, J. W., and Juncosa Calahorrano, J.: Satellite measurements of peroxyacetyl nitrate from the Cross-Track Infrared Sounder: comparison with ATom aircraft measurements, *Atmos. Meas. Tech.*, 15, 3497–3511, <https://doi.org/10.5194/amt-15-3497-2022>, 2022.
 12. J. L. Laughner, J. L. Neu, D. Schimel, P. O. Wennberg, K. Barsanti, K. W. Bowman, A. Chatterjee, B. E. Croes, H. L. Fitzmaurice, D. K. Henze, J. Kim, E. A. Kort, Z. Liu, **K. Miyazaki**, A. Turner, S. Anenberg, J. Avise, H. Cao, D. Crisp, J. de Gouw, A. Eldering, J. C. Fyfe, D. L. Goldberg, K. R. Gurney, S. Hasheminassab, F. Hopkins, C. E. Ivey, D. B. A. Jones, J. Liu, N. S. Lovenduski, R. V. Martin, G. A. McKinley, L. Ott, B. Poulter, M. Ru, S. P. Sander, N. Swart, Y. L. Yung, Z.-C. Zeng, Societal shifts due to COVID-19 reveal large-scale complexities and feedbacks between atmospheric chemistry and climate change, *Proceedings of the National Academy of Sciences* Nov 2021, 118 (46) e2109481118; DOI:10.1073/pnas.2109481118, 2021
 13. Hansen Cao, Daven K. Henze, Liye Zhu, Mark W. Shephard, Karen Cady-Pereira, Enrico Dammers, Michael Sitwell, Nicholas Heath, Chantelle Lonsdale, Jesse O. Bash, **Kazuyuki Miyazaki**, Christophe Flechard, Yannick Fauvel, Roy Wichink Kruit, Stefan Feigenspan, Christian Brümmer, Frederik Schrader, Marsailidh M. Twigg, Sarah Leeson, Yuk S. Tang, Amy C. M. Stephens, Christine Braban, Keith Vincent, Mario Meier, Eva Seitler, Camilla Geels, Thomas Ellermann, Agnieszka Sanocka, Shannon L. Capps (2022), 4D-Var inversion of European NH₃ emissions using CrIS NH₃ measurements and GEOS-Chem adjoint with bi-directional and uni-directional flux schemes. *Journal of Geophysical Research: Atmospheres*, 127, e2021JD035687. <https://doi.org/10.1029/2021JD035687>
 14. Ogino, S.-Y., **Miyazaki, K.**, Fujiwara, M., Nodzu, M. I., Shiotani, M., Hasebe, F., et al. (2022). Cause of a lower-tropospheric high-ozone layer in spring over Hanoi. *Journal of Geophysical Research: Atmospheres*, 127, e2021JD035727. <https://doi.org/10.1029/2021JD035727>
 15. He, T.-L., Jones, D. B. A., **Miyazaki, K.**, Huang, B., Liu, Y., Jiang, Z., et al. (2022). Deep learning to evaluate US NO_x emissions using surface ozone predictions. *Journal of Geophysical Research: Atmospheres*, 127, e2021JD035597. <https://doi.org/10.1029/2021JD035597>

16. J. Chen, Z. Jiang, R. Li, C. Liao, **K. Miyazaki**, D. B. A. Jones, Large discrepancy between observed and modeled wintertime tropospheric NO₂ variabilities due to COVID-19 controls in China, *Environ. Res. Lett.*, *17*, 035007, <https://doi.org/10.1088/1748-9326/ac4ec0>
17. Z. Jiang, R. Zhu, **K. Miyazaki**, B. C. McDonald, Z. Klimont, B. Zheng, K. F. Boersma, Q. Zhang, H. Worden, J. R. Worden, D. K. Henze, D. B. A. Jones, H. A.C. Denier van der Gon, H. Eskes (2022). Decadal variabilities in tropospheric nitrogen oxides over United States, Europe, and China. *Journal of Geophysical Research: Atmospheres*, *127*, e2021JD035872. <https://doi.org/10.1029/2021JD035872>
18. Byrne, B., Liu, J., Lee, M., Yin, Y., Bowman, K. W., Miyazaki, K., et al. (2021). The carbon cycle of southeast Australia during 2019–2020: Drought, fires, and subsequent recovery. *AGU Advances*, *2*, e2021AV000469. <https://doi.org/10.1029/2021AV000469>
19. Jiang, Z., Shi, H., Zhao, B., Gu, Y., Zhu, Y., **Miyazaki, K.**, Lu, X., Zhang, Y., Bowman, K. W., Sekiya, T., and Liou, K.-N.: Modeling the impact of COVID-19 on air quality in southern California: implications for future control policies, *Atmos. Chem. Phys.*, *21*, 8693–8708, <https://doi.org/10.5194/acp-21-8693-2021>, 2021.
20. Sekiya, T., **Miyazaki, K.**, Ogochi, K., Sudo, K., Takigawa, M., Eskes, H., & Boersma, K. F. (2021). Impacts of horizontal resolution on global data assimilation of satellite measurements for tropospheric chemistry analysis. *Journal of Advances in Modeling Earth Systems*, *13*, e2020MS002180. <https://doi.org/10.1029/2020MS002180>
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Presentations

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+ More than 100 presentations at Japanese domestic conferences

Colloquia and Seminars

2022: UC Irvine, Harvard University, JPL Carbon Club, JAMSTEC
 2021: UCLA, NASA/NOAA Interagency COVID-AQ Discussion
 2018: KNMI, University of Toronto, Environment and Climate Change Canada
 2016: University of Toronto
 2015: NCAR, JPL, Wageningen University, UC Berkeley
 2013: University of Hawai'i, KNMI, University of Reading, Kyushu University, Ibaraki University
 2012: Eindhoven University of Technology, KNMI, University of Tokyo
 2010: KNMI, Nagoya University
 2007: Japan Meteorological Agency
 2006: Kyoto University, University of Tokyo
 2004: University of Chicago, NCAR, NOAA

Media releases

NASA Tracks COVID-19's Atmospheric Fingerprint <https://www.youtube.com/watch?v=mBXeA3v1NLY> used in "NASA Science Enables First-of-its-Kind Detection of Reduced Human CO2 Emissions" <https://www.nasa.gov/feature/goddard/2022/for-the-1st-time-nasa-spots-short-term-drops-in-co2-emissions-from-human-activity>
<https://science.nasa.gov/science-news/nasa-trackscovid-19s-atmospheric-fingerprint>

Local Lockdowns Brought Fast Global Ozone Reductions, NASA Finds, June 9, 2021 (more than 200 new articles) <https://www.jpl.nasa.gov/news/local-lockdowns-brought-fast-global-ozone-reductions-nasa-finds>

China's COVID Lockdown Significantly Cut Air Pollution-Related Hospitalizations, October 10, 2020 <https://nicholas.duke.edu/news/chinas-covid-lockdown-significantly-cut-air-pollution-related-hospitalizations>

Unexpected slowdown of US pollutant emission reduction in the past decade (in Japanese), May 1, 2018
http://www.jamstec.go.jp/j/about/press_release/20180501/

Decadal changes in global surface NOx emissions from multi-constituent satellite data assimilation (in Japanese), January 27, 2017 http://www.jamstec.go.jp/j/about/press_release/20170127/

Animations and articles for the general public: Global Tropospheric Ozone Response to Worldwide COVID-19 Lockdowns, <https://svs.gsfc.nasa.gov/4912>

Animations and articles for the general public: Reduction in Tropospheric NOx and Ozone Corresponding to Worldwide COVID-19 Lockdowns, <https://svs.gsfc.nasa.gov/4959>

Animations and articles for the general public: The impact of COVID-19 restrictions on global air quality, <https://www.youtube.com/watch?v=prTLw1YoiIU>

Peer review

Proceedings of the National Academy of Sciences, Elementa, Earth System Science Data, Scientific Reports, Journal of the Atmospheric Sciences, Journal of Geophysical Research –Atmosphere, Atmospheric Chemistry and Physics, Geoscientific Model Development, Journal of Atmospheric and Solar-Terrestrial Physics, Atmospheres, Environmental Pollution, Scientific Online Letters on the Atmosphere, Remote Sensing, Engineering and Applied Science Research, Geoscience letters, Environmental Research Letter, Geoscience Letters

Public lecture

2022: Middle school science class

2022: Elementary school science class

2021: Elementary school science class