

TAKANOBU YAMAGUCHI

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Immigration status:

Japanese citizenship, H-1B work visa

Present position:

Research Scientist II, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder, and NOAA Earth System Research Laboratory, Boulder, Colorado (2014 – present)

Research interests:

Clouds and turbulence, parameterization, numerical modeling and methods

Education:

Ph.D., 2010, Atmospheric Science, Colorado State University, advisor: D. A. Randall

M.S., 2005, Atmospheric Science, Colorado State University, advisor: D. A. Randall

B.S., 2002, Physics, Ehime University, Matsuyama, Ehime, Japan

Previous positions:

Research Scientist I, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder, and NOAA Earth System Research Laboratory, Boulder, Colorado (2011 – 2014)

Postdoctoral Fellow, Department of Atmospheric Science, Colorado State University (2010)

Graduate Research Assistant, Department of Atmospheric Science, Colorado State University (2002 – 2010)

Awards and Honors

Outstanding Performance Award, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder (2015)

Funded Projects

2016 – 2019: **Department of Energy**, “Quantifying the aerosol-cloud radiative effect through large eddy simulation and ground-based observations at Southern Great Plains.” Co-Principal investigator. **\$437,027**.

2016 – 2017: NOAA High Performance Computing and Communications Program, “A novel approach to quantifying the cloud radiative effect in a changing climate using a statistical emulator.” Co-Investigator. \$103,259.

Refereed Journal Publications

- Kazil, J., G. Feingold, and **T. Yamaguchi**, 2016: Wind speed response of marine non-precipitating stratocumulus clouds over a diurnal cycle in cloud-system resolving simulations. *Atmos. Chem. Phys.*, **16**, 5811-5839, doi:10.5194/acp-16-5811-2016.
- Feingold, G., A. McComiskey, **T. Yamaguchi**, J. Johnson, K. S. Carslaw, and K. S. Schmidt, 2016: New approaches to quantifying aerosol effects on cloud radiative forcing. *P. Natl. Acad. Sci. USA.*, doi:10.1073/pnas.1514035112.
- Yamaguchi, T.**, G. Feingold, J. Kazil, and A. McComiskey, 2015: Stratocumulus to cumulus transition in the presence of elevated smoke layers. *Geophys. Res. Lett.*, **42**, 10,478-410,485, doi:10.1002/2015GL066544.
- Feingold, G., I. Koren, **T. Yamaguchi**, and J. Kazil, 2015: On the reversibility of transitions between closed and open cellular convection. *Atmos. Chem. Phys.*, **15**, 7351-7367, doi: 10.5194/acp-15-7351-2015.
- Yamaguchi, T.**, and G. Feingold, 2015: On the relationship between open cellular convective cloud patterns and the spatial distribution of precipitation. *Atmos. Chem. Phys.*, **15**, 1237-1251, doi:10.5194/acp-15-1237-2015.
- Lee, S. S., G. Feingold, A. McComiskey, **T. Yamaguchi**, I. Koren, J. Vanderlei Martins, and H. Yu, 2014: Effect of gradients in biomass burning aerosol on shallow cumulus convective circulations. *J. Geophys. Res.*, **119**, 2014JD021819, doi:10.1002/2014JD021819.
- Solomon, A., M. D. Shupe, O. Persson, H. Morrison, **T. Yamaguchi**, P. M. Caldwell, and G. de Boer, 2014: The sensitivity of springtime arctic mixed-phase stratocumulus clouds to surface-layer and cloud-top inversion-layer moisture sources. *J. Atmos. Sci.*, **71**, 574-595, doi: 10.1175/JAS-D-13-0179.1.
- Kazil, J., G. Feingold, H. Wang, and **T. Yamaguchi**, 2014: On the interaction between marine boundary layer cellular cloudiness and surface heat fluxes. *Atmos. Chem. Phys.*, **14**, 61-79, doi:10.5194/acp-14-61-2014.
- Yamaguchi, T.**, W. A. Brewer, and G. Feingold, 2013: Evaluation of modeled stratocumulus-capped boundary layer turbulence with shipborne data. *J. Atmos. Sci.*, **70**, 3895-3919, doi: 10.1175/JAS-D-13-050.1.
- Yamaguchi, T.**, and G. Feingold 2013: On the size distribution of cloud holes in stratocumulus and their relationship to cloud-top entrainment, *Geophys. Res. Lett.*, **40**, 2450-2454, doi: 10.1002/grl.50442.
- Yamaguchi, T.**, and G. Feingold 2012: Technical note: Large-eddy simulation of cloudy boundary layer with the Advanced Research WRF model, *J. Adv. Model. Earth Syst.*, **4**, M09003, doi:10.1029/2012ms000164.

- Yamaguchi, T.**, and D. A. Randall, 2012: Cooling of entrained parcels in a large-eddy simulation. *J. Atmos. Sci.*, **69**, 1118-1136, doi:10.1175/jas-d-11-080.1.
- Yamaguchi, T.**, D. A. Randall, and M. F. Khairoutdinov, 2011: Cloud modeling tests of the ULTIMATE-MACHO scalar advection scheme. *Mon. Wea. Rev.*, **139**, 3248-3264, doi: 10.1175/mwr-d-10-05044.1.
- Lappen, C-L, D. A. Randall, and **T. Yamaguchi**, 2010: A higher-order closure model with an explicit PBL top. *J. Atmos. Sci.*, **67**, 834-850, doi:10.1175/2009JAS3205.1.
- Yamaguchi, T.**, and D. A. Randall, 2008: Large-eddy simulation of evaporatively driven entrainment in cloud-topped mixed layers. *J. Atmos. Sci.*, **65**, 1481-1504, doi: 10.1175/2007JAS2438.1.

Manuscripts in Submission

- Yamaguchi, T.**, G. Feingold, and V. E. Larson, 2016: Framework for improvement by vertical enhancement: A simple approach to improve low and high level clouds in large scale models. *J. Adv. Model. Earth Syst.*, in review.

Other Publications

Dissertation and thesis:

- Yamaguchi, T.**, 2010: Cloud-top entrainment analyzed with a Lagrangian parcel tracking model in large-eddy simulations. Ph.D. dissertation, Department of Atmospheric Science, Colorado State University, 131 pp.
- Yamaguchi, T.**, 2005: Analysis of PBL-top entrainment using LES. Master thesis, Department of Atmospheric Science, Colorado State University, 108 pp.

Presentations

Conference talks:

- Yamaguchi, T., G. Feingold, and J. Kazil, 2016: Modulation of stratocumulus to cumulus transition by rain. 17th International Conference on Clouds and Precipitation, Manchester, United Kingdom, July 2016.
- Yamaguchi, T., G. Feingold, J. Kazil, and A. McComiskey, 2015: Stratocumulus to cumulus transition capped by a light absorbing smoke layer. American Geophysical Union Fall Meeting, San Francisco, CA, December, 2015.
- Yamaguchi, T., and G. Feingold, 2014: Influence of spatial distribution of rain on transformation of open cellular circulation. 14th Conference on Cloud Physics, Boston, MA, July 2014.
- Yamaguchi, T., and G. Feingold, 2012: What are the dominant spatial scales for entrainment in marine stratocumulus? American Geophysical Union Fall Meeting, San Francisco, CA, December, 2012.

Yamaguchi, T., and D. A. Randall, 2010: Tracking parcels that are entrained across cloud tops. American Geophysical Union Fall Meeting, San Francisco, CA, December, 2010.

Yamaguchi, T., 2009: Marine stratocumulus cloud-top entrainment. 3rd Atsushi Numaguchi Symposium, Kashiwa, Chiba, Japan, March, 2009.

Yamaguchi, T., and D. A. Randall, 2006: Large-eddy simulation of evaporatively driven entrainment in cloud-topped mixed layers. 17th Symposium on Boundary Layers and Turbulence, San Diego, CA, May 2006.

Seminar talks:

Yamaguchi, T., G. Feingold, and J. Kazil, 2016: Modulation of Stratocumulus to cumulus transition by rain. University of Tokyo, Kashiwa, Chiba, Japan, August, 2016.

Yamaguchi, T., G. Feingold, J. Kazil, and A. McComiskey, 2016: Stratocumulus to cumulus transition in the presence of elevated smoke layers. Nagoya University, Nagoya, Aichi, Japan, June, 2016.

Yamaguchi, T., 2016: Exploring scale lows for PBL parameterization development. RIKEN Advanced Institute for Computational Science, Kobe, Hyogo, Japan, June, 2016.

Yamaguchi, T., 2014: On the relationship between open cellular convective cloud patterns and the spatial distribution of precipitation, University of Wyoming, Laramie, WY, November, 2014.

Yamaguchi, T., 2014: On the relationship between open cellular convective cloud patterns and the spatial distribution of precipitation, NOAA ESRL, Boulder, CO, September, 2014.

Yamaguchi, T., 2013: An introduction to atmospheric science. Ehime University, Matsuyama, Ehime, Japan, October, 2013.

Yamaguchi, T., and G. Feingold, 2013: On the size distribution of cloud holes in stratocumulus and their relationship to cloud-top entrainment. Nagoya University, Nagoya, Aichi, Japan, October, 2013.

Yamaguchi, T., and G. Feingold, 2013: On the size distribution of cloud holes in stratocumulus and their relationship to cloud-top entrainment. University of Tokyo, Hongo, Bunkyo-ku, Tokyo, Japan, October, 2013.

Yamaguchi, T., 2011: Marine stratocumulus and large-eddy simulation. RIKEN Advanced Institute for Computational Science, Kobe, Hyogo, Japan, September, 2011.

Yamaguchi, T., and D. A. Randall, 2011: Cooling of entrained parcels in a large-eddy simulation. Nagoya University, Nagoya, Aichi, Japan, September, 2011.

Yamaguchi, T., and D. A. Randall, 2011: Cooling of entrained parcels in a large-eddy simulation. University of Tokyo, Kashiwa, Chiba, Japan, September, 2011.

Yamaguchi, T., 2009: Marine stratocumulus cloud-top entrainment. Nagoya University, Nagoya, Aichi, Japan, March, 2009.

Yamaguchi, T., and D. A. Randall, 2007: Large-eddy simulation of evaporatively driven entrainment in cloud-topped mixed layers. Nagoya University, Nagoya, Aichi, Japan, May, 2007.

Other talks (project meetings):

- Yamaguchi, T., 2016: Implementation of Chin-Hoh's mixed SGS model and 5th-order WENO-Z momentum advection scheme into SAM, 20th CMMAP Team Meeting, Boulder, CO, January, 2016.
- Yamaguchi, T., G. Feingold, and V. E. Larson, 2015: Improving simulated low clouds in CSRM/GCM with Dual Vertical Resolution Framework, 19th CMMAP Team Meeting, Fort Collins, CO, August, 2015.
- Yamaguchi, T., and G. Feingold, 2013: Reconstructing the inversion layer. 15th CMMAP Team Meeting, Fort Collins, CO, August, 2013.
- Yamaguchi, T., and G. Feingold, 2013: LES evaluation based on ship-borne data. 3rd Annual CPT Meeting, Boulder, CO, February, 2013.
- Yamaguchi, T., and G. Feingold, 2013: Relationship between stratocumulus cloud hole size and entrainment. 14th CMMAP Team Meeting, Boulder, CO, January, 2013.
- Yamaguchi, T., 2012: New cases for VOCALS and AM3-SCM. 2nd Annual CPT Meeting, Boulder, CO, January, 2012.
- Yamaguchi, T., 2011: Statistics output package for WRF. 1st Annual CPT Meeting, Boulder, CO, February, 2011.
- Yamaguchi, T., 2010: Experiments with the ULTIMATE-MACHO scalar advection scheme in SAM. 9th CMMAP Team Meeting, Fort Collins, CO, August, 2010.
- Yamaguchi, T., 2010: Tracking parcels that are entrained across cloud tops. 9th CMMAP Team Meeting, Fort Collins, CO, August, 2010.
- Yamaguchi, T., 2009: Plan for large-eddy simulations of POST. POST Science and Data Workshop, Salt Lake City, UT, February, 2009.
- Yamaguchi, T., 2008: Modeling and physics of cloud-top entrainment instability. 5th CMMAP Team Meeting, Fort Collins, CO, July, 2008.
- Yamaguchi, T., 2008: Modeling and physics of cloud-top entrainment instability. POST Science Team Meeting, Monterey, CA, June, 2008.
- Yamaguchi, T., and D. A. Randall, 2008: Large-eddy simulations of CTEI under idealized conditions. 4th CMMAP Team Meeting, Los Angeles, CA, January, 2008.
- Yamaguchi, T., R. R. McCrary, and A. B. Harper, 2008: What the heck are low-cloud feedbacks? 4th CMMAP Team Meeting, Los Angeles, CA, January, 2008.

Posters:

- Yamaguchi, T., G. Feingold, and J. Kazil, 2015: Stratocumulus to cumulus transition capped by a light absorbing smoke layer. Gordon Research Conference, Lewiston, ME, July, 2015
- Yamaguchi, T., G. Feingold, I. Koren, and J. Kazil, 2015: Two-way transitions between closed and open cellular convection. Department of Energy Science Team Meeting, Vienna, VA, March, 2015

- Yamaguchi, T., and G. Feingold, 2014: Role of spatial distribution of rain in formation of open cellular circulation. American Geophysical Union Fall Meeting, San Francisco, CA, December, 2014.
- Yamaguchi, T., G. Feingold, V. E. Larson, and P. N. Blossey, 2013: Reconstructing the inversion layer in the stratocumulus-capped boundary layer. American Geophysical Union Fall Meeting, San Francisco, CA, December, 2013.
- Yamaguchi, T., and G. Feingold, 2012: What are the dominant spatial scales for entrainment in marine stratocumulus? American Geophysical Union Fall Meeting, San Francisco, CA, December, 2012.
- Yamaguchi, T., W. A. Brewer, and G. Feingold, 2012: Turbulence statistics of the nocturnal stratocumulus boundary layer: New approaches to model evaluation based on ship-borne data. 1st Pan-Global Atmospheric System Studies Conference, Boulder, CO, August, 2012.
- Yamaguchi, T., W. A. Brewer, and G. Feingold, 2012: Cloud microphysics and turbulence statistics of the nocturnal stratocumulus-capped boundary layer: New approaches to model evaluation based on ship-borne data. 13th CMMAP Team Meeting, Fort Collins, CO, August, 2012.
- Yamaguchi, T., W. A. Brewer, and G. Feingold, 2012: Cloud microphysics and turbulence statistics of the nocturnal stratocumulus-capped boundary layer: New approaches to model evaluation based on ship-borne data. 16th International Conference on Clouds and Precipitation, Leipzig, Germany, July, 2012.
- Yamaguchi, T., W. A. Brewer, and G. Feingold, 2011: Turbulence structure in LES and ship borne data during VOCALS-REx. American Geophysical Union Fall Meeting, San Francisco, CA, December, 2011.
- Yamaguchi, T., W. A. Brewer, and G. Feingold, 2011: Evaluation of WRF-LES with ship borne data during VOCALS-REx. World Climate Research Programme Open Science Conference, Denver, CO, October, 2011.
- Yamaguchi, T., and D. A. Randall, 2007: Large-eddy simulation of evaporatively driven entrainment in cloud-topped mixed layers. 87th American Meteorological Society Annual Meeting, San Antonio, TX, January, 2007.
- Yamaguchi, T., and D. A. Randall, 2006: Large-eddy simulation of evaporatively driven entrainment in cloud-topped mixed layers. 86th American Meteorological Society Annual Meeting, Atlanta, GA, February, 2006.

Professional Activities and Experiences

Memberships: American Geophysical Union, American Meteorological Society

Grant referees: National Science Foundation

Journal referees: Atmospheric Chemistry and Physics, Geophysical Research Letters, Journal of Advances in Modeling Earth Systems, Journal of Geophysical Research, Journal of the Atmospheric Sciences, Progress in Earth and Planetary Science, Quarterly Journal of the Royal Meteorological Society

Field work: Physics Of Stratocumulus Top (POST), Monterey, CA, 2008

Student advising / mentoring: Joseph Balsells, summer 2015

Teaching: Teaching assistant, Atmospheric Modeling, Department of Atmospheric Science,
Colorado State University