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### **Summary of Professional Experience**

Mr. Shook is a research physical scientist in the Chemistry and Dynamics Branch of the Science Directorate at NASA's Langley Research Center. He has over eight years of experience in participating in suborbital earth science and aeronautics research projects, which involved cross-agency collaboration as well as coordinating with international partners and other external organizations.

Mr. Shook has successfully provided meteorological forecasting support for the NAAMES (2015-2018), NDMAX (2018), and ACTIVATE (2020) NASA airborne field campaigns. As part of this support, he conducted pre-deployment climatological studies of parameters of interest for each project. During the campaigns, he assembled meteorological and aerosol forecast products, provided analysis and insight for them, and presented them to the science team as part of daily briefings. Moreover, he made substantial contributions to designing optimal sampling strategies to achieve the project science objectives. After the completion of each campaign, he also contributed summary analysis for project overview papers.

In addition, as a member of the NASA LaRC Suborbital Science Data for Atmospheric Composition team, Mr. Shook provides data management support to atmospheric science projects. These efforts involve airborne field campaigns as well as the ground-based Tropospheric Ozone Lidar Network (TOLNet). His responsibilities include ensuring instrument PIs meet data management plan requirements (such as submission deadlines, data format standards, and metadata specifications); leading the effort to create merged data files widely used by the science team and the public; and coordinating data and metadata transfer to the project's assigned data center.

Mr. Shook also has performed data acquisition, processing, and analysis for numerous aircraft and ground-based field experiments (2012-2020) as a member of the Langley Aerosol Research Group (LARGE). He has contributed to the design and assembly of two novel aerosol and cloud water measurement systems, and he provides custom data acquisition and processing software for an extensive suite of in-situ aerosol microphysical, optical, and composition instruments. Mr. Shook also has been responsible for LARGE's timely and accurate data submission for those instruments for ten of their field experiments. Finally, Mr. Shook contributes to the scientific goals of the group by developing analyses for science team presentations, professional organization meetings, and peer-reviewed journal articles.

### **Education**

- B.S., Atmospheric Science, University of Kansas, KS, 2012

### **Professional Employment History**

2017 – Present, Research Physical Scientist, NASA LaRC, Hampton, VA

2012 – 2017, Programmer/Analyst, Science Systems and Applications, Inc., Hampton, VA

## Relevant Professional Awards

- NASA Early Career Public Achievement Award (2017)
- NASA Langley HJE Reid Award (2018)
- NASA Group Achievement Awards (2013, 2014, 2015, 2016, 2019, 2020)

## Selected Recent Publications

- Zhang, Y., K. Sun, Z. Gao, Z. Pan, M. Shook, and D. Li. "Diurnal climatology of planetary boundary layer height over the contiguous United States derived from AMDAR and reanalysis data." *Journal of Geophysical Research: Atmospheres*: e2020JD032803. doi:10.1029/2020JD032803.
- Saliba, G., C.-L. Chen, S. Lewis, L. M. Russell, P. K. Quinn, T. S. Bates, T. G. Bell, M. J. Lawler, E. S. Saltzman, K. J. Sanchez, R. Moore, M. Shook et al. "Seasonal Differences and Variability of Concentrations, Chemical Composition, and Cloud Condensation Nuclei of Marine Aerosol over the North Atlantic." *Journal of Geophysical Research: Atmospheres* 125, no. 19 (2020): e2020JD033145. doi: 10.1029/2020JD033145.
- Crosbie, Ewan, M. A. Shook, et al. "Coupling an online ion conductivity measurement with the particle-into-liquid sampler: Evaluation and modeling using laboratory and field aerosol data." *Aerosol Science and Technology* (2020): 1-14. doi: 10.1080/02786826.2020.1795499.
- Jordan, C. E., J. H. Crawford, A. J. Beyersdorf, T. F. Eck, H. S. Halliday, B. A. Nault, L.-S. Chang, J. Park, R. Park, G. Lee, H. Kim, J.-Y. Ahn, S. Cho, H. J. Shin, J. H. Lee, J. Jung, D.-S. Kim, M. Lee, T. Lee, A. Whitehill, J. Szykman, M. K. Schueneman, P. Campuzano-Jost, J. L. Jimenez, J. P. DiGangi, G. S. Diskin, B. E. Anderson, R. H. Moore, L. D. Ziemba, M. A. Fenn, J. W. Hair, R. E. Kuehn, R. E. Holz, G. Chen, K. Travis, M. Shook et al. "Investigation of factors controlling PM 2.5 variability across the South Korean Peninsula during KORUS-AQ." *Elem Sci Anth* 8, no. 1 (2020). doi:10.1525/elementa.424.
- Sorooshian, A., A. F. Corral, R. A. Braun, B. Cairns, E. Crosbie, R. Ferrare, J. Hair, M. M. Kleb, A. H. Mardi, H. Maring, A. McComiskey, R. Moore, D. Painemal, A. J. Scarino, J. Schlosser, T. Shingler, M. Shook et al. "Atmospheric Research Over the Western North Atlantic Ocean Region and North American East Coast: A Review of Past Work and Challenges Ahead." *Journal of Geophysical Research: Atmospheres* 125, no. 6 (2020): e2019JD031626. doi: 10.1029/2019JD031626.
- Behrenfeld, M. J., R. H. Moore, C. A. Hostetler, J. Graff, P. Gaube, L. M. Russell, G. Chen, S. C. Doney, S. Giovannoni, H. Liu, C. Proctor, L. M. Bolaños, N. Baetge, C. Davie-Martin, T. K. Westberry, T. S. Bates, T. G. Bell, K. D. Bidle, E. S. Boss, S. D. Brooks, B. Cairns, C. Carlson, K. Halsey, E. L. Harvey, C. Hu, L. Karp-Boss, M. Kleb, S. Menden-Deuer, F. Morison, P. K. Quinn, A. J. Scarino, B. Anderson, J. Chowdhary, E. Crosbie, R. Ferrare, J. W. Hair, Y. Hu, S. Janz, J. Redemann, E. Saltzman, M. Shook et al. "The North Atlantic aerosol and marine ecosystem study (NAAMES): science motive and mission overview." *Frontiers in Marine Science* 6 (2019): 122. doi:10.3389/fmars.2019.00122.
- Crosbie, E., M. D. Brown, M. Shook et al. "Development and characterization of a high-efficiency, aircraft-based axial cyclone cloud water collector." (2018). doi:10.5194/amt-11-5025-2018.
- Alexandrov, M. D., B. Cairns, K. Sinclair, A. P. W., L. Ziemba, E. Crosbie, R. Moore, J. Hair, A. J. Scarino, Y. Hu, S. Stamnes, M. A. Shook, and G. Chen. "Retrievals of cloud droplet size from the research scanning polarimeter data: Validation using in situ measurements." *Remote Sensing of Environment* 210 (2018): 76-95. doi:10.1016/j.rse.2018.03.005.
- Moore, R. H., K. L. Thornhill, B. Weinzierl, D. Sauer, E. D'Ascoli, B. Beaton, A. J. Beyersdorf, D. Bulzan, C. Corr, E. Crosbie, R. Martin, D. Riddick, M. Shook et al. "Biofuel blending reduces particle emissions from aircraft engines at cruise conditions." *Nature* 543, no. 7645 (2017): 411-415. doi: 10.1038/nature21420.