
EDUCATION

- 2018 **Ph.D. in Meteorology and Atmospheric Science**, Department of Meteorology and Atmospheric Science, The Pennsylvania State University, University Park, Pennsylvania.
Dissertation: Toward improved regional estimates of carbon dioxide sources and sinks through coupled carbon-atmospheric data assimilation.
Advisor: Fuqing Zhang. Co-advisors: Richard B. Alley and Thomas Lauvaux.
- 2012 **M.S. in Atmospheric Sciences, Oceanography and Climate**, Department of Meteorology, Stockholm University, Stockholm, Sweden.
Thesis: The Barents Oscillation and its impact on the Arctic climate.
Advisor: Heiner Körnich. Co-advisor: Qiong Zhang.
- 2010 **B.S. in Meteorology**, Department of Meteorology, Stockholm University, Stockholm, Sweden.
Thesis: Local impact of soot on surface temperature in India and Sweden.
Advisor: Annica Ekman. Co-advisor: Henning Rodhe.

EMPLOYMENT

- 2020–present **Researcher**, Department of Physical Geography and Ecosystem Science, Lund University, Lund, Sweden.
- 2018–2020 **Postdoctoral Fellow**, Department of Physical Geography and Ecosystem Science, Lund University, Lund, Sweden.

AWARDS AND HONORS

- 2020 **NASA Group Achievement Award**, NASA Langley Research Center.
For exceptional scientific achievements of the ACT-America Earth Venture Suborbital mission.
- 2020 **Stiftelsen Landshövding Per Westlings Minnesfond**, Lund University.
- 2018 **Outstanding Student Paper Award**, American Meteorological Society, 20th Conference on Atmospheric Chemistry.
- 2016 **Öfverdirektör Elis Sidenbladhs Fond**, Royal Swedish Academy of Sciences.
- 2016 **Top 5 most highly cited papers 2014–2016 in Environmental Development**, Environmental Development, Elsevier.
- 2016 **Travel Support**, University Corporation for Atmospheric Research.
- 2014 **Hans Neuberger Award**, The Pennsylvania State University.
For excellent teaching of meteorology.
- 2014 **Chi Epsilon Pi**, The Pennsylvania State University.
National meteorology honor society.

2013 **Student Travel Award**, American Meteorological Society.

COMMISSIONS OF TRUST

2021–present **Deputy** in the CoCO2 General Assembly.

RESEARCH GRANTS

2021–2024 **Principal Investigator**, High-resolution carbon cycle data assimilation with multiple satellite observations, *Joint China–Sweden Mobility*, Stiftelsen för internationalisering av högre utbildning och forskning.

PEER-REVIEWED PUBLICATIONS

- 2021 Cai, Z., Q. You, F. Wu, **H. W. Chen**, D. Chen, and J. Cohen (2021): Arctic warming revealed by multiple CMIP6 models: Evaluation of historical simulations and quantification of future projection uncertainties. *Journal of Climate*, **34**(12), 4871–4892. doi:10.1175/JCLI-D-20-0791.1.
- 2021 Lai, H.-W., **H. W. Chen**, J. Kukulies, T. Ou, and D. Chen (2021): Regionalization of seasonal precipitation over the Tibetan Plateau and associated large-scale atmospheric systems. *Journal of Climate*, **34**(7), 2635–2651. doi:10.1175/JCLI-D-20-0521.1.
- 2020 Cohen, J., X. Zhang, J. Francis, T. Jung, R. Kwok, J. Overland, T. Ballinger, U. S. Bhatt, **H. W. Chen**, D. Coumou, S. Feldstein, D. Handorf, G. Henderson, M. Ionita, M. Kretschmer, F. Laliberte, S. Lee, H. W. Linderholm, W. Maslowski, Y. Peings, K. Pfeiffer, I. Rigor, T. Semmler, J. Stroeve, P. C. Taylor, S. Vavrus, T. Vihma, S. Wang, M. Wendisch, Y. Wu, and J. Yoon (2020): Divergent consensus on the influence of Arctic amplification on mid-latitude severe winter weather. *Nature Climate Change*, **10**, 20–29. doi:10.1038/s41558-019-0662-y.
- 2019 **Chen, H. W.**, L. N. Zhang, F. Zhang, K. J. Davis, T. Lauvaux, S. Pal, B. Gaudet, and J. P. DiGangi (2019): Evaluation of regional CO₂ mole fractions in the ECMWF CAMS real-time atmospheric analysis and NOAA CarbonTracker Near-Real Time reanalysis with airborne observations from ACT-America field campaigns. *Journal of Geophysical Research–Atmospheres*, **124**, 8119–8133. doi:10.1029/2018JD029992.
- 2019 **Chen, H. W.**, F. Zhang, T. Lauvaux, K. J. Davis, S. Feng, M. P. Butler, and R. B. Alley (2019): Characterization of regional-scale CO₂ transport uncertainties in an ensemble with flow-dependent transport errors. *Geophysical Research Letters*, **46**, 4049–4058. doi:10.1029/2018GL081341.
- 2016 **Chen, H. W.**, R. B. Alley, and F. Zhang (2016): Interannual Arctic sea ice variability and associated winter weather patterns: A regional perspective for 1979–2014. *Journal of Geophysical Research–Atmospheres*. **121**, 14,433–14,455, doi:10.1002/2016JD024769.
- 2016 **Chen, H. W.**, F. Zhang, and R. B. Alley (2016): The robustness of midlatitude weather pattern changes due to Arctic sea ice loss. *Journal of Climate*, **29**, 7831–7849, doi:10.1175/JCLI-D-16-0167.1.

- 2013 **Chen, H. W.**, Q. Zhang, H. Körnich, and D. Chen (2013): A robust mode of climate variability in the Arctic: The Barents Oscillation. *Geophysical Research Letters*, **40**, 2856–2861, doi:10.1002/grl.50551.
- 2013 Chen, D. and **H. W. Chen** (2013): Using the Köppen classification to quantify climate variation and change: An example for 1901–2010. *Environmental Development*, **6**, 69–79, doi:10.1016/j.envdev.2013.03.007.

SUBMITTED MANUSCRIPTS

- 2021 Fang, M., X. Li, D. Chen, and **H. W. Chen** (2021): What drives Arctic amplification variations on multi-decadal to century time scales? *Submitted*.
- 2021 Kaminski, T., M. Scholze, P. Rayner, M. Voßbeck, M. Buchwitz, M. Reuter, W. Knorr, **H. W. Chen**, A. Agustí-Panareda, A. Löscher, and Y. Meijer (2021): Atmospheric CO₂ observations from space can support national inventories. *In preparation for resubmission*.
- 2021 Wang, X., Y. Ran, G. Pang, D. Chen, B. Su, R. Chen, X. Li, **H. W. Chen**, M. Yang, R. Li, X. Peng, T. Wu, G. Wan, D. Luo (2021): A comparison between past and future permafrost changes in the Arctic and the Tibetan Plateau and possible links between them. *Submitted to Earth-Science Reviews*.

OTHER PUBLICATIONS

- 2020 Scholze, M., **H. Chen**, T. Kaminski, and M. Voßbeck (2020): Inversion strategy based on joint QND assessments. *CHE Consortium*.
- 2018 **Chen, H.** and M. Scholze (2018): Progress in characterizing uncertainty for fossil fuel emissions. *CHE Consortium*.
- 2018 Ying, Y., X. Chen, Y. Zhang, M. Minamide, R. Nystrom, **H. Chen**, J. Poterjoy, C. Melhauser, Y. Weng, Z. Meng, A. Aksoy, and F. Zhang (2018): PSU WRF EnKF/4DVar hybrid regional data assimilation system: Technical notes.
- 2018 Cohen, J., X. Zhang, J. Francis, T. Jung, R. Kwok, J. Overland, P. C. Tayler, S. Lee, F. Laliberte, S. Feldstein, W. Maslowski, G. Henderson, J. Stroeve, D. Coumou, D. Handorf, T. Semmler, T. Ballinger, M. Hell, M. Kretschmer, S. Vavrus, M. Wang, S. Wang, Y. Wu, T. Vihma, U. Bhatt, M. Ionita, H. Linderholm, I. Rigor, C. Routson, D. Singh, M. Wendisch, D. Smith, J. Screen, J. Yoon, Y. Peings, **H. Chen**, and R. Blackport (2018): Arctic change and possible influence on mid-latitude climate and weather: a US CLIVAR White Paper. *U.S. CLIVAR White Paper 2018-1*, 41 pp. doi:10.5065/D6TH8KGW

INVITED TALKS

- 2021 Assessing the uncertainty in top-down greenhouse gas emissions estimates, to be presented at the *Asia Oceania Geosciences Society Virtual 18th Annual Meeting*.
- 2020 Coupled carbon–atmospheric data assimilation through ensemble-based simultaneous state and parameter estimation, *Fuqing Zhang Symposium* (canceled due to Covid-19).

- 2018 Monitoring Earth's carbon cycle and human fossil fuel emissions with the help of advanced data assimilation methods, *Second ADAPT Symposium on Advanced Understanding, Monitoring and Prediction of Weather, Climate and Environmental systems*.
- 2018 Constraining surface carbon dioxide fluxes using advanced data assimilation techniques, *98th American Meteorological Society Annual Meeting*.

TEACHING EXPERIENCE

2019–present **Lund University**

- Theory and Methods of Physical Geography, Contributing instructor (Fall 2019, Fall 2020 online).

2013–2017 **The Pennsylvania State University**

- Co-advisor for research project (Summer 2017).
- Introduction to Programming Techniques for Meteorology, Main instructor and course developer (Spring 2015), Teaching assistant (Spring 2013).
- Applications of Computers to Meteorology, Co-instructor (Fall 2013), Teaching assistant (Fall 2014, Spring 2014).
- Synoptic Meteorology Laboratory, Teaching assistant (Fall 2015).

OUTREACH

- 2021 **Interview for the European Environment Agency COINS project**, about monitoring CO₂ emissions on city scales using top-down and inverse approaches.
- **Research websites**, over 223,000 views and 79,000 unique visitors since 2013. Example: <http://hanschen.org/koppen>.

SERVICE TO PROFESSION

2020–present **Organizer of department seminar series**, Department of Physical Geography and Ecosystem Science, Lund University, Lund, Sweden.

- **Reviewer** for the following journals: Nature Climate Change, Atmospheric Chemistry and Physics, Geophysical Research Letters, Journal of Geophysical Research: Atmospheres.

NON-ACADEMIC WORK

- 2008 **Computer programmer**, IVL Swedish Environmental Research Institute, Gothenburg, Sweden.

OTHER RELEVANT EXPERIENCES

- 2016 **NCAR Advanced Study Program Summer Colloquium**, Advances in Air Quality Analysis and Prediction: The Interaction of Science and Policy, National Center for Atmospheric Research, Colorado.

COMPUTER SKILLS

| | | | |
|--------------|-----------------------------|---------------|-------------------------------------|
| OS | Linux, Unix, Windows, macOS | Graphics | Adobe Photoshop, Inkscape |
| Programming | Python, Fortran, C++, C | Typography | L ^A T _E X |
| Numerical | MATLAB, Mathematica | Office suites | Microsoft Office, LibreOffice |
| Shell script | Bash, Z shell | Other | Git, regular expressions, HTML, CSS |

LANGUAGES

| | |
|---------------|---|
| Native | Swedish |
| Fluent | English |
| Mother tongue | Mandarin , fluent speaking, basic reading and writing. |
| Basic | German |

SELECTED PRESENTATIONS

- 2021 Assessment of radiocarbon observations for constraining fossil fuel emissions in a comprehensive Carbon Cycle Fossil Fuel Data Assimilation System, *EGU General Assembly 2021*, Online Oral.
- 2020 Assessment of capability of in-situ and satellite CO₂ observations to monitor CO₂ fossil fuel emissions, *Asia Oceania Geosciences Society 17th Annual Meeting*, Oral (canceled due to Covid-19).
- 2020 Assessments of in situ and remotely sensed CO₂ observations in a Carbon Cycle Fossil Fuel Data Assimilation System to estimate fossil fuel emissions, *EGU General Assembly 2020*, Online Text Chat.
- 2019 Potential benefit of ¹⁴CO₂ observations in CO₂ inversions quantified using the coupled Carbon Cycle Fossil Fuel Data Assimilation System, *IG3IS-Transcom workshop 2019*, Poster.
- 2018 Arctic-mid latitude linkages: Lessons learned and future coordinated modeling experiments, *8th Third Pole Environment Workshop*, Oral.
- 2018 Estimating CO₂ surface fluxes using atmospheric CO₂ concentration: How an atmospheric scientist became interested in plants, *INES Thursday seminar series*, Oral.
- 2018 Characterizing CO₂ transport errors for regional inversions using a coupled carbon-atmospheric data assimilation system, *AGU Fall Meeting 2018*, Poster.

- 2018 A joint regional carbon–atmosphere inversion system with explicit treatment of transport uncertainties, *IG3IS–Transcom workshop 2018*, Poster.
- 2018 Progress toward estimating surface carbon dioxide fluxes at the regional scale using an augmented ensemble Kalman filter, *98th American Meteorological Society Annual Meeting*, Poster.
- 2018 Constraining regional-scale CO₂ fluxes using a coupled meteorological-carbon ensemble Kalman filter, *8th EnKF Data Assimilation Workshop*, Oral.
- 2017 Towards improved estimates of regional CO₂ fluxes: A unified carbon and meteorological data assimilation system, *2017 Joint NACP and AmeriFlux Principal Investigators Meeting*, Poster.
- 2017 The robustness of mid-latitude weather pattern changes due to Arctic sea-ice loss, *2017 Arctic Mid-Latitude Workshop*, Poster and Lightning Talk.
- 2016 Nonlinear atmospheric response to Arctic sea-ice loss under different sea ice scenarios, *ADAPT Symposium on Advanced Assimilation and Uncertainty Quantification in BigData Research for Weather, Climate and Earth System Monitoring and Prediction*, Oral.
- 2016 Predictability of mid-latitude extreme weather changes in response to Arctic sea ice loss, *96th American Meteorological Society Annual Meeting*, Poster.
- 2014 Dynamics and predictability of atmospheric response to reduced Arctic sea ice through ensemble sensitivity analysis, *World Weather Open Science Conference 2014*, Oral.