Duo Chan

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I have a background in statistical climatology and atmospheric and ocean dynamics. I develop statistical models and use physical simulations to reconstruct climate variability and understand the underlying dynamics. My current work includes improving historical sea temperature data, understanding the role of sea surface temperatures in hurricane genesis, and understanding changes in summertime temperature variability in climate projections.

Education

2015-21 **Ph.D.** in Earth and Planetary Sciences, Harvard University (Advisor: Peter Huybers)
2013-15 **M.S.** in Meteorology, Nanjing University, China
2009-13 **B.S.** in Applied Meteorology and **Minor** in Finance, Nanjing University, China

Awards and Honors

2021 Weston Howland Jr. Postdoctoral **Fellow**, WHOI
2021 High Meadows Environmental Institute Environmental **Fellow**, Princeton (Declined)
2021 Outstanding Student Oral Presentation, 101st AMS
2020 Harvard Horizons **Fellow**
2019 Harvard GSAS professional development award
2015-16 William Benjamin and Jill Kowal Graduate Aid Fund in Environmental Studies

Professional Service

Reviewer: *Journal of Climate, Geophysical Research Letter, Climate Dynamics, Earth and Space Science, 2021 NOAA Small Business Innovation Research Funding Opportunity*
Organizer: Harvard ClimaTea seminar (2017)
Mentoring and Advising: National Collegiate Research Conference (2021), Sarah King (2020-present), David Ma (Summer, 2020), Alexandria Berry (2018--19)

Publications

Manuscripts Under Review
Peer-reviewed Publication (* co-first author)

14. **Chan D.,** Vecchi G., Yang W. & Huybers P. Correcting 19th and 20th century sea surface temperatures improves simulations of Atlantic hurricane activity. *Science Advances.* **In press.**

13. **Chan D.,** & Huybers P (2021). Correcting sea surface temperature observations removes World War II warm anomaly. *Journal of Climate,* 34(11), 4585-4602.

12. **Chan D.** (2021). Combining statistical, physical, and historical evidence to improve historical sea surface temperature records. *Harvard Data Science Review*. 3(1), doi: 10.1162/99608f92.edcee38f

11. Dai C., **Chan D*.**, Huybers P., & Pillai, N. (2021). Late 19th-century navigational uncertainties and their influence on sea surface temperature estimates. *Annals of Applied Statistics,* 15(1): 22-40.

10. **Chan D.,** & Huybers P. (2020). Systematic differences in bucket sea surface temperatures caused by misclassification of engine room intake measurements. *Journal of Climate*. 33(18), 7735–7753
9. **Chan D.,** Cobb A., Vargas L., Battisti D., & Huybers P. (2020). Summertime temperature variability increases with local warming in mid-latitude regions. *Geophysical Research Letters*, e2020GL087624.
8. **Chan D.,** Zhang, Y., Wu Q., & Dai X. (2020). Quantifying the dynamics of the interannual variabilities of the wintertime East Asian Jet Core. *Climate Dynamics*, 54(3), 2447-2463.
7. **Chan D.,** Kent E., Berry D. & Huybers P. (2019). Correcting datasets leads to more homogeneous early 20th century sea surface warming. *Nature*, 571, 393-397. (Selected media coverage: *NPR*)
6. **Chan D.** & Huybers P. (2019). Systematic differences in bucket sea surface temperature measurements amongst nations identified using a linear-mixed-effect method. *Journal of Climate*, 32(5), 2569-2589.
5. Hu, C., Wu, Q., Yang, S., Yao, Y., **Chan, D.**, Li, Z., & Deng, K. (2016). A linkage observed between austral autumn Antarctic Oscillation and preceding Southern Ocean SST anomalies. *J. Clim*, 29(6), 2109-2122.
4. Wu, Q., Cheng, L., **Chan, D.**, Yao, Y., Hu, H., & Yao, Y. (2016). Suppressed mid-latitude summer atmospheric warming by Arctic sea ice loss during 1979–2012. *GRL*, 43(6), 2792-2800.
3. **Chan, D.**, Wu, Q., Jiang, G., & Dai, X. (2016). Projected shifts in Köppen climate zones over China and their temporal evolution in CMIP5 multi-model simulations. *Advances in Atmospheric Sciences*, 3(33), 283-293.
2. **Chan, D.**, & Wu, Q. (2015). Significant anthropogenic-induced changes of climate classes since 1950. *Scientific Reports*. 5. 13487. (Selected media coverage: *Yale Climate Connections*)
1. **Chan, D.**, & Wu, Q. (2015). Attributing observed SST trends and sub-continental land warming to anthropogenic forcing during 1979–2005. *Journal of Climate*, 28, 3152–3170.

Ph.D. Thesis: Combining statistical, physical, and historical methods to improve the quality and interpretations of historical sea surface temperature data.

Conferences and Presentations

Invited Talks

- Combining statistical, physical, and historical methods to improve historical sea surface temperature data *(Yale University, Oct. 2020， Princeton University, Nov. 2020, U.K. National Oceanography Centre, Mar. 2021)*
- Applying statistical methods to climate reconstructions -- Late 19th-century navigational errors and their influence on sea surface temperatures *(Virtual Joint Statistical Meeting, 2020)*
- Climate detective: Combining statistical, physical, and historical methods to improve historical sea surface temperature data *(Harvard Horizons, 2020, postponed to 2021 due to COVID19)*
- Correcting datasets leads to more homogeneous early-twentieth-century sea surface warming *(Fudan University, 2019; Nanjing University, 2019)*

Conference Talks

- Improved simulation of 19th and 20th-century hurricane frequency after correcting historical sea surface temperatures *(AMS, 2021)*

- Correcting sea surface temperature observations removes World War II warm anomaly *(AGU, 2020)*
- Correcting datasets leads to more homogeneous early-twentieth-century sea surface warming *(International meeting on statistical climatology, 2019; CLIMAR5 Workshop on Advances in Marine Climatology, 2019)*
- Remote control of surface soil moisture on projections of summertime mid-latitude land temperature variability *(ACDC, 10-year reunion, 2019; EGU, 2018)*
- On the dynamics of the interannual variability of the East Asian jet *(15th AOGS Meeting, 2018)*

Posters

- Improved SSTs better predict multi-decadal variability of Atlantic TC count *(AGU, 2019; AMS, 2020)*
- Correcting datasets leads to more homogeneous early-twentieth-century sea surface warming *(AGU 2018; Frontiers in Oceanic, Atmospheric, and Cryospheric Boundary Layers, KITP, 2018; AGU 2017)*
- Are the diurnal cycles of sea surface temperature increasing since the 1970s? *(AGU, 2016)*
- Significant anthropogenic-induced changes of climate classes since 1950 *(AGU, 2014)*
- Attribution of observed SST trends and sub-continental land warming to anthropogenic forcing during 1979-2005 *(AGU, 2013)*
- Inter-annual variability in the position and strength of the East Asian jet stream and its relation to large-scale circulation *(EGU, 2013)*

Teaching Experience

Teaching Assistant: Responsibilities included developing new class materials, leading class discussions, grading all assignments, and meeting with students individually.

1. **Paleoclimate as prologue** (Spring, 2021). Harvard EPS, to happen
2. **Weather, Water, and Climate** (Winter, 2019-20). Perry School, ~10 7th grades (Public school outreach)
3. **Climate change debate** (Spring, 2019). Harvard college, 28 undergraduates (UGs)
4. **Paleoclimate as prologue** (Fall, 2016). Harvard EPS, 3 UGs and 6 graduates (Gs)
5. **General Circulation of the Atmosphere** (Fall, 2014). Nanjing University, ~5 UGs and ~30 Gs

Summer Schools

2019 Ecole Polytechnique: Fluid Dynamics of Sustainability and the Environment,
2017 University of Bergen: Advanced Climate Dynamics Courses
2017 Beijing University: Climate, Weather, Pollution & Health Consequences
2016 Chicago University: Rossbypalooza