

# 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 focuses on improving historical sea-surface temperature (SST) data and on how corrected SSTs deepen our understanding of decadal climate variability and hurricane genesis.

## EDUCATION

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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

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2021 Weston Howland Jr. Postdoctoral Fellow, WHOI  
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

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**Reviewer:** *Journal of Climate*, *Geophysical Research Letter*, *Climate Dynamics*

**Organizer:** Harvard ClimaTea seminar (2017)

**Undergraduate Research Mentor:** Sarah King (2020-present), David Ma (Summer, 2020)

## PUBLICATIONS

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### Manuscripts Under Review

- **Chan D.**, & Huybers P. Correcting sea surface temperature observations removes World War II warm anomaly. In review.
- **Chan D.**, Vecchi G., Yang W. & Huybers P. Correcting 19th and 20th century sea surface temperatures improves simulations of Atlantic hurricane activity. In review.

### Peer-reviewed Publication (\* co-first author)

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. **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
10. Dai C., **Chan D\***, Huybers P., & Pillai, N. (2020). Late 19th-century navigational uncertainties and their influence on sea surface temperature estimates. *Annals of Applied Statistics*. In press.
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

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### Invited Talks

- Combining statistical, physical, and historical methods to improve historical sea surface temperature data (*Yale University, Oct. 2020, Princeton University, Nov. 2020*)
- 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 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

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**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 7<sup>th</sup> 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

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- 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