

Chunli Dai Ph. D.

School of Forest, Fisheries, and Geomatics Sciences (SFFGS)

University of Florida

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Professional Experience

School of Forest, Fisheries, and Geomatics Sciences (SFFGS), University of Florida

08/2022-present Assistant Professor

Department of Civil and Environmental Engineering, Louisiana State University

08/2021-08/2022 Assistant Professor

Byrd Polar and Climate Research Center, The Ohio State University

06/2020–08/2021 Research Scientist

07/2018–06/2020 Senior Research Associate

10/2016–07/2018 Research Associate

School of Earth Sciences, The Ohio State University

10/2015–10/2016 Postdoctoral Fellow

09/2009–08/2015 Graduate Research Assistant and Graduate Fellow

Education

Ph. D. Geodetic Science, The Ohio State University, Columbus, Ohio, USA, 2015

M. Sc. Geodetic Science, The Ohio State University, Columbus, Ohio, USA, 2012

M. Sc. Astrometry and Celestial Mechanics, Chinese Academy of Sciences, Shanghai, China, 2011

B. Sc. Geophysics, School of Geodesy and Geomatics, Wuhan University, Wuhan, China, 2007

Teaching Experience

Course taught at University of Florida

SUR 6535: GPS-INS

3 credit graduate course.

Integration

Principles of inertial navigation and its integration with GPS, mechanization of inertial navigation sensor measurements, space state representation of system errors, linear state equations, and practical Kalman filter techniques.

Spring 2023

Course taught at Louisiana State University

Civil Engineering 3500: Plane 3 credit undergraduate course.

Surveying and Measurements Plane surveying theory of measurements; use of surveying equipment; field and office work for boundary surveys and topographic mapping.

Fall 2021, Spring 2022

Courses taught at The Ohio State University

Earth Sciences 4310: Remote 3 credit undergraduate course.

Sensing in Earth Sciences Responsibilities include lectures on specific topics, helping students individually, and course website maintenance. Course website:

(Assistant Instructor)

<http://go.osu.edu/GeodeticRemoteSensing>

Fall 2016

Geodetic Science 8873: 3 credit graduate course.

Advanced Satellite Geodesy Responsibilities include lectures on basic concepts in the course laboratory sections, and advising on student projects.

(Teaching Assistant)

Spring 2016; Autumn 2013

Geodetic Science 6777: 3 credit graduate course.

Satellite Geodesy Responsibilities include brief lectures in the course laboratory sections on materials including Linux, MATLAB, GMT, Fortran, C++, geodetic data

(Teaching Assistant)

Fall 2015; Spring 2014; Spring 2013 processing (GRACE, GPS, altimetry), GAMIT, maintaining course websites, and grading.

Grants Awarded

NASA Earth Surface and Interior, Title: *Detecting and deciphering precursory landslide activity in the thawing mountains of Western North America*; PI: **Chunli Dai**, Co-Is: Myoung-Jong Noh, Ian Howat, Zhong Lu; 2023-2025.

NASA Sea Level Change Science Team, Title: *From grounding lines to coastlines: an integrated approach to barystatic sea-level projections*; OSU PI: **Chunli Dai**, PI: Eric Larour, Co-Is: Surendra Adhikari, Lambert Caron, Alex Gardner, Ian Howat, Erik Ivins, Dimitris Menemenlis, Justin Quinn, Nicole-Jeanne Schlegel, Helene Seroussi; 2020-2024.

NASA Earth Surface and Interior, Title: *Quantifying Arctic Mass Wasting Using ArcticDEM*; PI: **Chunli Dai**, Co-Is: Ian Howat, Jeffery Freymueller, Anna Liljedahl; 2020-2022.

NASA Terrestrial Hydrology Program, Title: *Estimating Arctic river discharge from ArcticDEM*; PI: Michael Durand, Co-Is: **Chunli Dai**, Renato Frasson, Ian Howat; 2018-2020.

NASA Earth and Space Science Fellowship, Title: *Earthquake seismic deformation from spaceborne gravimetry*; PI: C. Shum, Co-I: **Chunli Dai**; 2012-2015. This grant provided support for Dai's Ph.D. thesis at OSU, under C.K. Shum. The thesis demonstrated improved earthquake source parameters constraint by spaceborne gravimetric measurements. (Also listed under "Scholarships and Awards")

Ohio Supercomputer Center Proposal, Title: *Global and regional temporal gravity field model inversion from satellite gravimetry/gradiometry for geodynamics and climate change studies*; PI: C. K. Shum, Co-I: **Chunli Dai**; 2013; Total allocation: 30,000 resource units.

Travel Grants awarded by Friends of Orton Hall Funds, School of Earth Sciences, The Ohio State Univ. IAG Symposia, Potsdam, Germany, August 2013; American Geophysical Union Meeting, December 2014.

Grants Pending

NASA MEASURES, Title: *Polar Surface Change and Precise Elevations (PolarSCAPE)*; Institute PI: **Chunli Dai**, PI: Claire Porter, Co-Is: Erik Husby, Ian Howat; 2022-2027.

Peer Reviewed Journal Publications

24. **Dai, C.**, Howat, I.M., Liljedahl, A.K., van der Sluijs, H., Hignman, J., B., Freymueller, J.T., Ward Jones, M. K., Walker, B., Marsh, P., Boike, J., 2023. Applications of ArcticDEM for measuring volcanic dynamics, landslides, retrogressive thaw slumps, snow drifts, and vegetation heights, *Remote Sensing of Environment*, In preparation.
23. Shin, Y.H., Shum, C.K., Braitenberg, C., Lee, S.M., Lim, M., Na, S.H., **Dai, C.**, Zhang, C., Pan, Y., Do, S.H. and So, B.D., 2022. Decoupled Lithospheric Folding, Lower Crustal Flow Channels, and the Growth of Tibetan Plateau. *Geophysical Research Letters*, 49(13), p.e2022GL099183, <https://doi.org/10.1029/2022GL099183>.
22. **Dai, C.**, Howat, I.M., Freymueller, J.T., Lu, Z., Vijay, S., Liljedahl, A.K., Jones, M.K.W., Bergstedt, H. and Lev, E., 2022. Quantifying mass flows at Mt. Cleveland, Alaska between 2001 and 2020 using satellite photogrammetry. *Journal of Volcanology and Geothermal Research*, 429, p.107614, <https://doi.org/10.1016/j.jvolgeores.2022.107614>.
21. Moortgat, J., Li, Z., Durand, M., Howat, I., Yadav, B. and **Dai, C.**, 2022. Deep learning models for river classification at sub-meter resolutions from multispectral and panchromatic commercial satellite imagery. *Remote Sensing of Environment*, 282, p.113279, <https://doi.org/10.1016/j.rse.2022.113279>.
20. Geertsema, M., Menounos, B., Bullard, G., Carrivick, J.L., Clague, J.J., **Dai, C.**, Donati, D., Ekstrom, G., Jackson, J.M., Lynett, P. and Pichierri, M., 2022. The 28 November 2020 landslide, tsunami, and outburst flood—a hazard cascade associated with rapid deglaciation at Elliot Creek, British Columbia, Canada. *Geophysical research letters*, 49(6), p.e2021GL096716, <https://doi.org/10.1029/2021GL096716>.
19. **Dai, C.**, Hignman, B., Lynett, P.J., Jacquemart, M., Howat, I.M., Liljedahl, A.K., Dufresne, A., Freymueller, J.T., Geertsema, M., Ward Jones, M. and Haeussler, P.J., 2020. Detection and assessment of a large and potentially tsunamigenic periglacial landslide in Barry Arm, Alaska. *Geophysical Research Letters*, p.e2020GL089800, <https://doi.org/10.1029/2020GL089800>.

18. **Dai, C.**, Howat, I.M., Freymueller, J., Vijay, S., Jia, Y., 2020. Characterization of the 2008 phreatomagmatic eruption of Okmok from ArcticDEM and InSAR: deposition, erosion, and deformation. *Journal of Geophysical Research: Solid Earth*, 125(6), p.e2019JB018977, <https://doi.org/10.1029/2019JB018977>.
17. **Dai, C.**, Howat, I.M., Larour, E. and Husby, E., 2019. Coastline extraction from repeat high resolution satellite imagery. *Remote Sensing of Environment*, 229, pp.260-270, <https://doi.org/10.1016/j.rse.2019.04.010>.
16. **Dai, C.**, Durand, M., Howat, I.M., Altenau, E.H. and Pavelsky, T.M., 2018. Estimating river surface elevation from ArcticDEM. *Geophysical Research Letters*, 45(7), pp.3107-3114, <https://doi.org/10.1002/2018GL077379>.
15. **Dai, C.** and Howat, I.M., 2018. Detection of Saturation in High-Resolution Pushbroom Satellite Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 11(5), pp.1684-1693, <https://doi.org/10.1109/JSTARS.2018.2814543>.
14. **Dai, C.**, Guo, J., Shang, K., Shum, C.K. and Wang, R., 2018. The effect of Earth's oblateness on the seismic moment estimation from satellite gravimetry. *Geophysical Journal International*, 213(2), pp.1297-1304, <https://doi.org/10.1093/gji/ggy056>.
13. **Dai, C.** and Howat, I.M., 2017. Measuring lava flows with ArcticDEM: Application to the 2012–2013 eruption of Tolbachik, Kamchatka. *Geophysical Research Letters*, 44(24), pp.12-133, <https://doi.org/10.1002/2017GL075920>.
12. **Dai, C.**, Shum, C.K., Guo, J., Shang, K., Tapley, B. and Wang, R., 2016. Improved source parameter constraints for five undersea earthquakes from north component of GRACE gravity and gravity gradient change measurements. *Earth and Planetary Science Letters*, 443, pp.118-128, <https://doi.org/10.1016/j.epsl.2016.03.025>.
11. Shang, K., Guo, J., Shum, C.K., **Dai, C.** and Luo, J., 2015. GRACE time-variable gravity field recovery using an improved energy balance approach. *Geophysical Journal International*, 203(3), pp.1773-1786, <https://doi.org/10.1093/gji/ggv392>.
10. **Dai, C.**, Shum, C.K., Wang, R., Wang, L., Guo, J., Shang, K. and Tapley, B., 2014. Improved constraints on seismic source parameters of the 2011 Tohoku earthquake from GRACE gravity and gravity gradient changes. *Geophysical Research Letters*, 41(6), pp.1929-1936, <https://doi.org/10.1002/2013GL059178>.
9. Guo, J.Y., Li, Y.B., **Dai, C.** and Shum, C.K., 2013. A technique to improve the accuracy of Earth orientation prediction algorithms based on least squares extrapolation. *Journal of Geodynamics*, 70, pp.36-48, <https://doi.org/10.1016/j.jog.2013.06.002>.
8. Iz, H., Shum, C. and **Dai, C.**, 2012. Polyaxial figures of the Moon from the lunar reconnaissance orbiter laser altimetry and multi-mission synthesis of the lunar shape. *Journal of geodetic science*, 2(2), pp.107-112, <https://doi.org/10.2478/v10156-010-0007-2>.
7. Wang, L., Shum, C.K., Simons, F.J., Tapley, B. and **Dai, C.**, 2012. Coseismic and postseismic deformation of the 2011 Tohoku-Oki earthquake constrained by GRACE gravimetry. *Geophysical Research Letters*, 39(7), L07301, <https://doi.org/10.1029/2012GL051104>.
6. Iz, H., Ding, X., **Dai, C.** and Shum, C., 2011. Polyaxial figures of the Moon. *Journal of geodetic science*, 1(4), pp.348-354, <https://doi.org/10.2478/v10156-011-0013-z>.
5. Iz, H.B., Shum, C.K., Chen, Y.Q. and **Dai, C.**, 2011. An improved geometric lunar figure from Chang'E-1 and SELENE laser altimetry. *Journal of applied geodesy*, 5(3-4), pp.175-185, <https://doi.org/10.1515/JAG.2011.011>.
4. Iz, H., Shum, C., Ding, X. and **Dai, C.**, 2011. Orientation of the geometrically Best fitting triaxial lunar ellipsoid with respect to the mean earth/polar axis reference frame. *Journal of geodetic science*, 1(1), pp.52-58, <https://doi.org/10.2478/v10156-010-0007-2>.
3. Shum, C., Tseng, K., Kuo, C., Cheng, K., **Dai, C.**, Duan, J., Huang, Z., Lee, H., Song, S., Yang, M. and Zhu, W., 2011. Validation of GNSS-Observed climate variables over Tibetan Plateau. *Journal of Aeronautics, Astronautics and Aviation*, 43(1), pp.009-016.

2. Sun, J., **Dai, C.**, Jian, N., Zhou, Y., Wang, G. and Ping, J., 2010. Investigation of stronger diurnal ERP signals in summer derived from the VLBI CONT08 campaign. *Chinese Science Bulletin*, 55(29), pp.3274-3278, <https://doi.org/10.1007/s11434-010-4076-5>.
1. Tseng, K.H., Shum, C.K., Yi, Y., **Dai, C.**, Lee, H., Bilitza, D., Komjathy, A., Kuo, C.Y., Ping, J. and Schmidt, M., 2010. Regional validation of Jason-2 dual-frequency ionosphere delays. *Marine Geodesy*, 33(S1), pp.272-284, <https://doi.org/10.1080/01490419.2010.487801>.

Academic Conference Proceedings & Other Publications

7. Tseng, K.H., Liu, K.T., Shum, C.K., Jia, Y., Shang, K. and **Dai, C.**, 2016. Quantification of Glacier Depletion in the Central Tibetan Plateau by Using Integrated Satellite Remote Sensing and Gravimetry. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLI-B8, pp. 399-402.
6. **Dai, C.**, 2015. Source Parameters Inversion for Recent Large Undersea Earthquakes from GRACE Data (Doctoral dissertation, The Ohio State University).
5. **Dai, C.**, 2011. Studies on the application of GPS / GNSS (Original in Chinese, translated) (Master's Thesis, Chinese Academy of Sciences).
4. **Dai, C.** and Ping, J.S., 2009. Modeling and prediction of TEC in China region for satellite navigation. *In 2009 15th Asia-Pacific Conference on Communications*, pp.310-313. IEEE.
3. **Dai, C.**, Ping, J., Zhu, W. and Wang, G., 2009. High frequency ERP retrieved from GPS data. *Proceedings of Global Navigation Satellite System: Technology Innovation and Application* (International Association of Chinese Professionals in Global Positioning Systems (CPGPS) 2009), pp.250-256.
2. **Dai, C.** and Ping, J.S., 2009. A forecasting method for the global 2-D ionosphere model (Original in Chinese, translated). *China Science And Technology Achievements*, 10(10), pp.14-16.
1. **Dai, C.**, Sun, J., Wang, G. and Ping, J., 2009. How many GPS stations' data are required to detect the high frequency ERP (Original in Chinese, translated). *China Science And Technology Achievements*, 10(14), pp.27.

Scholarships and Awards

NASA Earth and Space Science Fellowship, 2012–2015
 The Kaarina and Weikko A. Heiskanen Junior Award, 2015
 Distinguished Senior Ph.D. Student Award, 2013
 Michael Johnson Graduate Student Award, 2012
 Graduate Book Award, 2011
 Graduate School of the Chinese Academy of Sciences Scholarship, 2007–2008
 Wuhan University Scholarship, 2005–2006, Third Prize; 2004–2005, Third Prize; 2003–2004, Second Prize

Invited Presentations

4th NSRS Modernization Overview & Prospectives Annual Workshop, September 23, 2022.
 The Louisiana State University Coast & Environment Seminar, September 16, 2022.
 The Permafrost Discovery Gateway Webinar, August 11, 2022.
 The Louisiana State University Department of Geology and Geophysics Seminar, March 4, 2022.
 The National Oceanic and Atmospheric Administration Coastal Ocean Modeling seminar, October 27, 2020.
 The Polar Geospatial Center Users Webinar Series, September 23, 2020.
 Interagency Hydrology Committee for Alaska (IHCA), November 7 and 8, 2018.
 The Ohio State University School of Earth Sciences 8898 Seminar, March 2016.
 The Ohio State University Department of Civil, Environmental and Geodetic Engineering Seminar, Feb., 2016.
 The Ohio State University Satellite Geodesy Lecture, February 2016.
 German Geodetic Research Institute (DGFI), September 2013.

Selected Conference Presentations

- Li, Z., Moortgat, J., Leong, W.J., **Dai, C.**, Howat, I., Yadav, B. and Durand, M.T., 2022, December. Super-Resolution Deep Neural Networks for Water Classification at 2-m Resolution from Sentinel-2 Satellite Imagery. AGU Fall Meeting, Chicago, IL, USA, 12 -16 December 2022.
- Dai, C.**, I. Howat, M. Jones, J. van der Sluijs, N. Nesterova, A. Liljedahl, and J. Freymueller, Mapping Retrogressive Thaw Slumps Using ArcticDEM and Machine Learning. *AGU Fall Meeting*, New Orleans, LA, USA, 13-17 December 2021.

- Dai, C.**, I. Howat, J. Freymueller, A. Liljedahl, M. Ward Jones, and B. Higman, Establishing a database for volcano eruptions and landslides using ArcticDEM, *AGU Fall Meeting*, online everywhere, 1-17 December 2020.
- Dai, C.**, I. M. Howat, E. Larour, High Resolution Arctic Coastline from Satellite Imagery, *AGU Fall Meeting*, Washington, DC, USA, 10-14 December 2018.
- Shum, C.K., K. Shang, J. Guo, **C. Dai**, Satellite gravity at local scales for Earth science and applications, *Sino-German Symposium on Gravitational Physics in Space*, Max Planck Institute for Gravitational Physics, Albert Einstein Institute, Hannover, Germany, 13–17 September, 2015.
- Dai, C.**, C. Shum, J. Guo, K. Shang, R. Wang, Improved source parameter constraints for large undersea earthquakes using GRACE gravimetry, *APSG International Symposium*, Moscow, Russia, 24–28 August 2015.
- Shum, C.K., K. Shang, **C. Dai**, J. Duan, O. Akilnaz, A. Bezdek, E. Forootan, J. Guo, F. Hossain, J. Klokocník, J. Sebea, M. Schmidt, Applications of energy balance and regional gravity modeling approach on GRACE estimates of terrestrial water storage changes, *IUGG General Assembly*, Prague, Czech Republic, 2 June–2 July, 2015.
- Dai, C.**, C.K. Shum, R. Wang, J. Guo, K. Shang, B. Tapley, and L. Wang, Improved source parameter constraints for recent large undersea earthquakes from high-degree GRACE gravity and gravity gradient change measurements, *AGU Fall Meeting*, San Francisco, California, USA, 15–19 December 2014.
- Dai, C.**, L. Wang, C. K. Shum, J. Guo, K. Shang, Improved constraints of seismic source parameters for the March 2011 Tohoku-Oki earthquake using gravity and gravity gradient change data from GRACE, *APSG International Symposium*, Columbus, OH, USA, Oct. 14-17, 2013.
- Dai, C.**, L. Wang, C. K. Shum, J. Guo, K. Shang, Improved constraints of seismic source parameters for the 2011 March Tohoku-Oki earthquake from GRACE gravity and gravity gradient change measurements, *IGAG Scientific Assembly*, Potsdam, Germany, 1–6 September, 2013.

Selected Professional Posters

- Dai, C.**, I. Howat, and J.T. Freymueller, Measuring Landslides and Volcanic Eruptions with ArcticDEM, *AGU Fall Meeting*, pp.G33C-0694, San Francisco, December 9-13, 2019.
- Dai, C.**, C.K. Shum, J. Guo, K. Shang, R. Wang, Source models of several undersea earthquakes, constraint with GRACE Data, *the 6th Third Pole Environment (TPE) Workshop*, Columbus, OH, USA, May 16-18, 2016.
- Shang, K., J. Guo, C. K. Shum, **C. Dai**, J. Duan, M. Schmidt, Global and regional temporal gravity model inversion using GRACE data, *IGAG Scientific Assembly*, Potsdam, Germany, 1–6 September, 2013.
- Shang, K., J. Guo, C. K. Shum, **C. Dai**, M. Schmidt, An improved energy integral approach for gravity field inversion, *IGAG Scientific Assembly*, Potsdam, Germany, 1–6 September, 2013.
- Kuo, C., C. Shum, H. Lee, **C. Dai**, and Y. Yi, Interdisciplinary Earth science applications using satellite altimetry, *AGU Fall Meeting*, San Francisco, December 3–7, 2012.

Professional Memberships

American Geophysical Union (2014-present)

Technical Reviewer: Proposals

Review panelist for NASA Decadal Survey Incubation Program; Ohio Supercomputing Center proposals; Research Grants Council (RGC) of Hong Kong.

Technical Reviewers: Journals

Scientific Reports; Geophysical Research Letters; Journal of Geophysical Research; Journal of Geodynamics; Journal of Geodesy; Advances in Space Research; Earth, Planets and Space; Arabian Journal of Geosciences; Geodesy and Geodynamics; International Association of Geodesy Symposia; the Science China Earth Sciences; Geoscience and Remote Sensing Letters; Geophysical Journal International; Nature Communications; Nature Geoscience.

Mentoring Experience

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| 2022- present | Advisor for Ph.D. student Thomas Casteel at the University of Florida. |
| 2022- present | Advisor for Master student Emmanuel Budukumah at the University of Florida. |
| 2021- 2022 | Advisor for Master student Bernard Boakye at the Louisiana State University. |

2017-2018 Senior thesis co-advisor for Steven E. Ferreira at The Ohio State University.
2015-2018 Co-Mentor for Ph.D. student Chaoyang Zhang at The Ohio State University.

Service

2016 Invited participant at the Education and Outreach strategy session, Byrd Polar Research Center.

Selected Interviews in Popular Media

History Channel, May 4, 2022, “The UnXplained with William Shatner”.

EurekAlert, November 13, 2020, “Retreating glacier presents landslide threat, tsunami risk in Alaskan fjord”,
https://www.eurekalert.org/pub_releases/2020-11/nsfc-rgp111320.php.

NASA Earth Observatory, October 6, 2020, “The Specter of a Mega-Tsunami in Alaska”,
<https://earthobservatory.nasa.gov/images/147345/the-specter-of-a-mega-tsunami-in-alaska>.

The New York Times, 14 May 2020, “‘It Could Happen Anytime’: Scientists Warn of Alaska Tsunami Threat”,
<https://www.nytimes.com/2020/05/14/climate/alaska-landslide-tsunami.html>.

Earth & Space Science (EOS) News, 20 December 2019, “Using Satellites and Supercomputers to Track Arctic Volcanoes”, <https://eos.org/articles/using-satellites-and-supercomputers-to-track-arctic-volcanoes>.