

## EDUCATION

---

**Ph.D.** 2017, Geological Sciences, *The University of Texas at Austin*

*Thesis:* Drivers of change in East Antarctic ice shelves

**M.S.** 2010, Mechanical Engineering, *The University of Texas at Austin*

*Thesis:* Low-frequency acoustics of methane hydrates

**B.S.** 2007, Mechanical Engineering with honors, *Virginia Commonwealth University*

## PROFESSIONAL EXPERIENCE

---

Dr. Greene is a satellite remote sensing and machine learning specialist in the Sea Level and Ice Group at JPL/Caltech, where he is a member of the NASA MEaSUREs ITS\_LIVE Earth data development team. He has conducted multiple seasons of airborne geophysical surveys in Antarctica and carried out ship-based science in the Arctic, Gulf of Mexico, and Baltic Sea. Dr. Greene is a prolific coder, creator of many open-source MATLAB and Julia packages, and has a passion for thorough documentation. He has served on the MathWorks Community Advisory Board and as editor of the *Proceedings of the National Academy of Sciences*.

## PEER-REVIEWED PUBLICATIONS

---

LA López, AS Gardner, **CA Greene**, & others. [ITS\\_LIVE: A Cloud-Native Approach to Monitoring Glaciers from Space](#). *Computing in Science & Engineering*, 2024.

**CA Greene** & others. [The Tide Model Driver for MATLAB](#), *Journal of Open Source Software*, 2024.

**CA Greene**, AS Gardner, M Wood, JK Cuzzone. [Ubiquitous acceleration in Greenland Ice Sheet calving from 1985 to 2022](#), *Nature*, 2024.

B Davison,..., **CA Greene**, & others. [Annual mass budget of Antarctic ice shelves from 1997 to 2021](#), *Science Advances*, 2023.

F Paolo, AS Gardner, **CA Greene**, & others. [Widespread slowdown in thinning rates of West Antarctic ice shelves](#), *The Cryosphere*, 2023.

I Vaňková, JP Winberry,..., **CA Greene**, & others. [High spatial melt rate variability near the Totten Glacier grounding zone explained by new bathymetry inversion](#). *Geophysical Research Letters*, 2023.

Y Nakayama, T Hirata, D Goldberg, **CA Greene**. [What determines the shape of a Pine-Island-like ice shelf?](#) *Geophysical Research Letters*, 2022.

**CA Greene**, AS Gardner, NJ Schlegel, AD Fraser. [Antarctic calving loss rivals ice-shelf thinning](#), *Nature*, 2022.

Y Nakayama, **CA Greene**, & others. [Antarctic Slope Current modulates ocean heat intrusions towards Totten Glacier](#). *Geophysical Research Letters*, 2021.

**CA Greene**, AS Gardner, LC Andrews. [Detecting seasonal ice dynamics in satellite images](#). *The Cryosphere*, 2020.

W Wei, DD Blankenship,..., **CA Greene**, & others [Getz Ice Shelf melt enhanced by freshwater discharge from beneath the West Antarctic Ice Sheet](#). *The Cryosphere*, 2020.

**CA Greene**, K Thirumalai, KA Kearney, & others. [The Climate Data Toolbox for MATLAB](#). *Geochemistry, Geophysics, Geosystems*, 2019.

**CA Greene** & K Thirumalai. [It's time to shift emphasis away from code sharing](#). *Eos*, 2019.

**CA Greene** & others. [Seasonal dynamics of Totten Ice Shelf controlled by sea ice buttressing](#). *The Cryosphere*, 2018.

CF Dow, WS Lee, JS Greenbaum, **CA Greene**, & others. [Basal channels drive active surface hydrology and transverse ice-shelf fracture](#). *Science Advances*, 2018.

**CA Greene** & DD Blankenship. [A Method of Repeat Photoclinometry for Detecting Kilometer-Scale Ice Sheet Surface Evolution](#). *IEEE Transactions on Geoscience and Remote Sensing*, 2018.

**CA Greene** & others. [Wind causes Totten Ice Shelf melt and acceleration](#). *Science Advances*, 2017.

**CA Greene**, DE Gwyther, DD Blankenship. [Antarctic Mapping Tools for Matlab](#). *Computers & Geosciences*, 2017.

KM Thyng, **CA Greene**, & others. [True colors of oceanography: Guidelines for effective and accurate colormap selection](#). *Oceanography*, 2016.

CJ Wilson, PS Wilson, **CA Greene**, KH Dunton. [Seagrass meadows provide an acoustic refuge for estuarine fish](#). *Marine Ecology Progress Series*, 2013.

**CA Greene** & PS Wilson. [Laboratory investigation of a passive acoustic method for measurement of underwater gas seep ebullition](#). *Journal of the Acoustical Society of America*, 2011.

CJ Wilson, PS Wilson, **CA Greene**, KH Dunton. [Seagrass leaves in 3-D: Using computed tomography and low-frequency acoustics to investigate the material properties of seagrass tissue](#). *Journal of Experimental Marine Biology and Ecology*, 2010.

#### NON-PEER-REVIEWED PUBLICATIONS

---

**CA Greene** & AS Gardner. [Greenland's glaciers are retreating everywhere and all at once](#). *Nature*, 2024.

AD Fraser & **CA Greene**. [Ice shelves hold back Antarctica's glaciers from adding to sea levels – but they're crumbling](#). *The Conversation*, 2022.

#### DATASETS

---

**CA Greene**, AS Gardner, M Wood, & JK Cuzzone. MEaSURES ITS\_LIVE Greenland Monthly 120 m Ice Sheet Extent Masks, 1972-2022, Version 1. *National Snow and Ice Data Center*, 2024.

SL Howard, **CA Greene**, & others. [CATS2008\\_v2023: Circum-Antarctic Tidal Simulation 2008, version 2023](#). *U.S. Antarctic Program (USAP) Data Center*, 2024.

FS Paolo, AS Gardner, **CA Greene**, & NJ Schlegel. [MEaSURES ITS\\_LIVE Antarctic Ice Shelf Height Change and Basal Melt Rates, Version 1](#). *National Snow and Ice Data Center*, 2023.

**CA Greene**, AS Gardner, NJ Schlegel, & AD Fraser. MEaSURES ITS\_LIVE Antarctic Annual Ice Masks, Version 1. *National Snow and Ice Data Center*, 2022.

#### EMPLOYMENT HISTORY

---

**NASA Jet Propulsion Laboratory** Pasadena, CA

Ice Sheet and Glacier Remote Sensing Research Scientist: Jan 2023 to present

Postdoctoral Research Fellow: Feb 2019 to Jan 2023

**Institute for Geophysics** Austin, TX

Research Engineering/Scientist: Sept 2015 to Feb 2019

Graduate Research & Teaching Assistant: Aug 2011 to Sept 2015

**Applied Research Laboratories** Austin, TX

Graduate Research Assistant: Jun 2007 to Aug 2011

**Virginia Commonwealth University** Richmond, VA

Teaching Assistant: Jan. 2007 to May 2007

**Federal Reserve Bank** Richmond, VA

Currency Systems Engineer Intern: May 2006 to Aug. 2006

#### FIELD WORK

---

**Pituffik Space Base** Pituffik (Thule), Greenland

Airborne surveys: Apr to May 2024

**Casey Station** Wilkes Land, Antarctica

Airborne surveys: Dec 2017 to Feb 2018

**Byrd Field Camp** Marie Byrd Land, Antarctica

Airborne surveys: Dec 2012 to Feb 2013

**Gulf of Mexico** Port Aransas, TX

Marine habitat acoustic study: 2009 to 2011

**Eckernförde Bay** Kiel, Germany

Sediment acoustics survey: Jun 2010 to Jul 2020

**Beaufort Sea** Arctic Ocean

USCG Polar Sea expedition Sep to Oct 2009

#### AWARDS, ACCREDITATIONS, & ACCOMPLISHMENTS

---

**NASA JPL Voyager Award** 2024

**NASA Postdoctoral Program Fellowship** 2019–2023

**MathWorks (MATLAB) Community Advisory Board** 2016–2022

**National Science Foundation Early Career Scientist Award** June 2018

**NASA Young Investigator Award** July 2016

**Univ. of Texas Institute for Geophysics Outstanding Graduate Student Award** May 2016

**MathWorks Award for Outstanding Contributions** 2015

**MATLAB File Exchange Pick-of-the-Week** July 2012, July 2013, July 2014

**United States Congressional Antarctic Service Medal** 2013

**Univ. of Texas College of Engineering Fellowship** 2007–2008

**NCEES Fundamentals of Engineering Exam** passed 2007

**Wright Merit Scholarship** 2002–2007

**Virginia Commonwealth University Dean's List** 2003–2005

**Virginia Commonwealth University Honors Program** 2002–2005

**Bicycled self-supported over 4200 miles from Oregon to North Carolina** 2005

**Eagle Scout** 2002

**Virginia State Certified Emergency Medical Technician** 2002

## IN THE NEWS

---

**FactCheck.org** 2024: [Antarctic Ice Loss Is Significant, Contrary to Claims.](#)

**New York Times** 2024: [How much ice is Greenland losing? Researchers found an answer.](#)

**The Atlantic** 2024: [A counterintuitive effect of global warming.](#)

**Rolling Stone** 2024: [Greenland's glaciers are melting way faster than we thought.](#)

**Washington Post** 2024: [Greenland is losing more ice than we thought. Here's what it means for our oceans.](#)

**The Guardian** 2024: [Greenland losing 30m tonnes of ice an hour, study reveals.](#)

**Smithsonian Magazine** 2023: [The World's Largest Iceberg Is Drifting Three Miles Into the Ocean Each Day](#)

**New Scientist** 2023: [Where is the iceberg that broke off Antarctica and is it a threat?](#)

**CNN** 2022: [World's largest ice sheet crumbling faster than previously thought, satellite imagery shows.](#)

**Time** 2022: [NASA Satellites Paint Grim Picture For The Future of Antarctica's Ice Shelves.](#)

**Forbes** 2022: [Antarctica's Coastal Glaciers Crumbling At Faster Rate Than Previously Believed.](#)

**Washington Post** 2022: [Climate change's impact intensifies as U.S. prepares to take action.](#)

**Washington Post** 2022: [Foreboding new studies show the climate battle is not over.](#)

**Scientific American** 2018: [Why Are Glaciers Melting from the Bottom? It's Complicated.](#)

**Scientific American** 2017: [How Wind Might Nudge a Sleeping Giant in Antarctica.](#)

**Wired** 2017: [For Scientists Predicting Sea Level Rise, Wind is the Biggest Unknown.](#)

## RESEARCH PRESENTATIONS

---

**CA Greene.** NASA in Greenland: 2024 UAVSAR Campaign. Pituffik Space Base Science Talk, Pituffik (formerly Thule), Greenland, Apr 2024.

**CA Greene & AS Gardner.** Freshwater anomalies from calving of the Greenland and Antarctic ice sheets. *Anomalous Freshwater Forcing for Climate Models Workshop*, Feb 2024. [invited]

**CA Greene & others.** Calving of the Greenland Ice Sheet since 1985. *Fall meeting of the American Geophysical Union*. San Francisco, USA, Dec 2023.

**AS Gardner, R Hugonnet, CA Greene, & others.** Global Glacier Mass Change from Satellite Laser Altimetry. *Fall meeting of the American Geophysical Union*. San Francisco, USA, Dec 2023.

**CA Greene & others.** Calving of the Greenland Ice Sheet since 1985. *International Union of Geodesy and Geophysics General Assembly*. Berlin, Germany, July 2023. [invited]

**CA Greene & others.** Firn model performance assessment with ICESat-2. *ICESat-2 Science Symposium*. Austin, TX, Oct 2022.

**CA Greene & others.** Airborne opportunities in Antarctica. *First International Workshop on Antarctic RINGS*, Tromsø, Norway, July 2022.

**CA Greene & others.** Coastal retreat doubles previous estimates of Antarctic ice shelf loss. *European Geophysical Union General Assembly*. Vienna, Austria, May 2022.

**CA Greene & others.** Antarctica's grounded-ice response to observed calving. *Fall meeting of the American Geophysical Union*. New Orleans, LA, Dec 2021.

**AS Gardner, ..., CA Greene, & others.** Surface topography observations needed to advance cryospheric science in the coming decades. *Fall meeting of the American Geophysical Union*. New Orleans, LA, Dec 2021.

**AS Gardner, ..., CA Greene, & others.** The NASA MEaSUREs ITS\_LIVE project: Accelerating glacier science through satellite data synthesis. *Fall meeting of the American Geophysical Union*. New Orleans, LA, Dec 2021.

**W Wei, ..., CA Greene, & others.** A new bathymetry surrounding and beneath the West Ice Shelf in East Antarctica. *Fall meeting of the American Geophysical Union*. New Orleans, LA, Dec 2021.

**Y Nakayama, CA Greene, & others.** Antarctic slope current controls warm ocean intrusions towards Totten Glacier. *European Geophysical Union General Assembly*. April 2021.

**Y Nakayama, CA Greene, & others.** The development of East Antarctic ocean simulation with a focus on the Totten Glacier. *Fall meeting of the American Geophysical Union*. Dec 2020.

**CA Greene.** Insights from satellite velocity maps. *Oates Land Workshop*. Hobart, Australia, Jan 2020.

**CA Greene & AS Gardner.** Satellite observations of Antarctic ice velocity variability. *Fall meeting of the American Geophysical Union*. San Francisco, USA, Dec 2019.

**F Ferraccioli, ..., & CA Greene.** Antarctic geothermal heat flux: past, present, and future perspectives. *Fall meeting of the American Geophysical Union*. San Francisco, USA, Dec 2019.

**CA Greene, AS Gardner, FS Paolo, & MP Schodlok.** Satellite observations of Antarctic ice velocity variability. *Forum for Research into Ice Shelf Processes*. Oxford, UK, Sep 2019.

- CA Greene.** Potential sea level contributions from Antarctica's Aurora Subglacial Basin. *Sea Level Summer School*. Delft, Netherlands, July, 2019.
- CA Greene & DD Blankenship.** Surface features of Totten Ice Shelf from satellite images and laser altimetry. *Forum for Research into Ice Shelf Processes*. Aussois, France, Sep 2018.
- CA Greene & others.** Seasonal Control on Totten Ice Shelf Dynamics by Sea Ice Buttressing. *POLAR2018 SCAR Meetings and Open Science Conference*. Davos, Switzerland, Jun 2018.
- CF Dow,..., **CA Greene**, & others. The role of basal channels in ice shelf calving. *Fall meeting of the American Geophysical Union*. Dec 2017.
- CA Greene & others.** Upwelling drives melt and acceleration of Totten Ice Shelf. *Forum for Research into Ice Shelf Processes*. Bergen, Norway, Jun 2017.
- CA Greene.** Low-Quality Satellite Images Reveal Dynamic Ice Shelf Processes. *University of Texas Institute for Geophysics Seminar Series*. Austin TX, Mar 2017.
- DA Young,..., **CA Greene**, & others. High-resolution subglacial hydrology of a potential old ice target near Dome C, Antarctica. *XXXIV SCAR Meetings and Open Science Conference*. Aug 2016.
- CA Greene & others.** Spatiotemporal patterns of surface elevation change for Totten Glacier ice shelf. *IGS International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean*. La Jolla, CA, Jul 2016.
- GR Muldoon, **CA Greene**, & K Thirumalai. Data visualization tips and tricks. *University of Texas Institute for Geophysics Seminar Series*. Austin, TX, Feb. 2016.
- CA Greene.** Antarctic Mapping Tools for MATLAB. *University of Texas Institute for Geophysics Seminar Series*. Austin, TX, Sep 2014.
- CA Greene, AK Bliss, & DD Blankenship.** A Bedmap2 Toolbox for MATLAB. *Fall Meeting of the American Geophysical Union*. San Francisco, CA, Dec 2013.
- CS Jackson,..., **CA Greene**, & others. Representation of Thwaites Glacier Bed Uncertainty for Modeling Experiments. *Fall Meeting of the American Geophysical Union*. San Francisco, TX, Dec 2013.
- DA Young, DD Blankenship, SD Kempf, & **CA Greene**. How well can we determine ice thickness? Examples from Thwaites Glacier. *International Symposium on Radioglaciology: A Meeting of the International Glaciological Society*. Sept 2013.
- CA Greene.** Bubbles and acoustics: An introduction to physical concepts in underwater sound. *University of Texas Institute for Geophysics Seminar Series*. Austin, TX, Mar 2013.
- C.S. Jackson, **CA Greene**, & others. Ice bed geometry: Estimates of known unknowns. *Proceedings of the Society for Industrial and Applied Mathematics Conference on Uncertainty Quantification*. 120 2012.
- CA Greene & others.** Acoustic determination of methane hydrate dissociation pressures. 7th International Conference on Gas Hydrates Edinburgh, Scotland, 2011.
- CA Greene & others.** Laboratory measurements on gas hydrates and bubbly liquids using active and passive low-frequency acoustic techniques. *Meeting of the Acoustical Society of America*. Seattle, WA, May 2011. [invited]
- CA Greene.** Low-frequency acoustic techniques for detection of gas hydrates, gassy sediments, and methane seeps. *Leibniz Institute of Marine Sciences at the University of Kiel IFM-GEOMAR*. Kiel, Germany, Jun 2010. [invited]
- CA Greene.** The didgeridoo—an ancient acoustic resonator. *Meeting of the Acoustical Society of America*. Baltimore, MD, Apr 2010. [invited]
- CA Greene & PS Wilson.** Toward passive acoustic remote sensing of ocean-bottom gas seeps. *Meeting of the Acoustical Society of America*. Baltimore, MD, Apr 2010.
- CA Greene.** Low-Frequency Acoustics of Methane Hydrates. *The University of Texas at Austin, Department of Mechanical Engineering. Seminars in Acoustics*, Austin, TX, Apr 2010. [invited]
- CA Greene, PS Wilson, & RB Coffin.** Measurements of the Acoustic Properties of Methane Hydrates. *Methane in the Arctic Shelf: American Geophysical Union Post-Cruise Workshop*, San Francisco, CA, Dec 2009. [invited]
- PS Wilson, TF Argo IV, & **CA Greene**. A demonstration of acoustic damping using bubbly liquid for Project Listen Up. *Meeting of the Acoustical Society of America* San Antonio, Nov 2009. [invited]
- CA Greene & PS Wilson.** Measurements of sound speed in bubbly liquids under high-pressure conditions. *Meeting of the Acoustical Society of America*. San Antonio, Nov 2009.
- CA Greene.** An Introduction to Sediment Acoustics. *Methane in the Arctic Shelf Expedition Scientists' Meeting*, USCG Polar Sea, Beaufort Sea, Sep 2009. [invited]
- TF Argo IV, **CA Greene**, & PS Wilson. A simple experiment for understanding resonant air columns. *Meeting of the Acoustical Society of America*. Portland, OR, May 2009.

**CA Greene** & others. A Helmholtz resonator experiment for the Listen Up project. *Meeting of the Acoustical Society of America*. Miami, FL, Nov 2008.

MJ Isakson, **CA Greene**, & others. Finite element modeling of range-dependent acoustic wave propagation in shallow water. Office of Naval Research Reverberation Workshop II. Austin, TX, May 2008.