

Katherine Pitts
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Career Summary

Scientist with 10+ years experience as a scientific programmer analyzing large earth science data sets. Currently provide product quality support to the NOAA & NASA GOES-R Series mission, ensuring that the products generated from these geostationary weather satellites meet mission requirements. Spent 4 years as sole scientific algorithm developer of the land and vegetation product for NASA's ICESat-2 satellite mission. Volunteered 7 years as highly effective panel member of NASA Goddard's Earth Sciences Data and Information Services Center's User Working Group. Received NASA Group Achievement Award for outstanding support of Agency programs that help the field centers and neighboring communities plan for and adapt to the impacts of climate change. Produce high quality visualizations for presenting scientific results, as recognized by 2 poster presentation awards at American Meteorological Society conferences.

Technology Summary

- Most familiar with Mac OS X and Linux (RHEL7) operating systems
- 10 years MATLAB experience for scientific programming and algorithm development
- Previous experience with numerous scripting/programming languages and scientific software packages

Operating Systems: Mac OS X, Linux (RHEL7), Unix (bash), Windows XP/7/8/10

Scripting/Programming: MATLAB, Python, IDL, NCL, C++, Fortran, HTML, LaTeX

Meteorology/Hydrology: WRF-ARW, McIDAS-V, AERMOD View, BASINS, WDM Utility, RAOB, WSI Media Suite

Software Packages: ArcGIS, QGIS, Microsoft Office, Adobe Creative Suite

Professional Experience

Science and Technology Corporation – Greenbelt, MD

○ Product Quality Specialist / Support Scientist (April 2019 – Present)

Work onsite at NASA Goddard with the GOES-R Program's Product Readiness and Operations team in the Ground Segment to assist with product quality validation efforts. Provide support to the GOES-R satellite series calibration/validation teams with a focus on lead-up activities for the GOES-T launch. Tasks include:

- Review and update documentation for post-launch product tests
- Interface with the calibration/validation working groups and the Flight Project regarding changes to the GOES-T and GOES-U post-launch product tests
- Engage in product validation reviews to ensure on-orbit products meet product maturity levels as defined by the mission requirements

Goddard Earth Sciences Data and Information Services Center (GES DISC) – Greenbelt, MD

- User Working Group Panel Member (November 2012 – Present)
 - Represent the needs of the Goddard earth science data user community
 - Evaluate GES DISC data visualization, exploration, and acquirement tools
 - Provide detailed feedback on tool usability and offer guidance to the GES DISC

EnviroComp Consulting, Inc. – Half Moon Bay, CA

- Scientist / Administrator (March 2011 – Present)
 - Acquire, analyze, and visualize meteorological and air quality data
 - Perform literature research, report preparation, and quality assurance
 - Maintain company website, produce outreach materials
 - Administrator of non-profit sister organization, The EnviroComp Institute

Applied Research Laboratories, The University of Texas at Austin – Austin, TX

- Engineering Scientist (February 2015 – April 2019)
 - R&D LiDAR Analyst in the Geospatial Laser Applications and Measurements group
 - Created practical solutions for automated feature extraction from LiDAR data
 - Developed algorithm to derive land & vegetation heights for NASA's ICESat-2 mission^{[P.1],[P.2]}
 - Prepared software user guides, and contributed to algorithm theoretical basis document^[P.3]
 - Roles included: supervisor, technical lead, and collaborator on multiple projects

TAMU Atmospheric Sciences Department – College Station, TX

- Graduate Research Assistant (July 2012 – January 2015)
 - Optimized a filtering and gridding algorithm using MATLAB
 - Compared cloud parameters from MODIS measurements to CMIP5 simulations
 - Analyzed overlap between Suomi NPP VIIRS and Aqua MODIS cloud products
 - Presented research at AGU^[C.8] and AMS^{[C.7],[C.11]} conferences
- Teaching Assistant: Satellite Meteorology and Remote Sensing (Jan. – May 2014)
 - Taught students to analyze satellite radiances and brightness temperatures
 - Instructed analysis of MODIS, GOES, and AIRS imagery with McIDAS-V software
- Research Experiences for Undergraduates (REU) Mentor (June 2013 – August 2013)
 - Assisted student with understanding atmospheric temperature profile data
 - Guided student with co-location and comparison of AIRS and radiosonde data

SJSU Meteorology and Climate Science Department – San José, CA

- Graduate Researcher (May 2009 – August 2012)
 - Used IDL to compare hydrologic parameters from GRACE satellite measurements to CMIP3 climate model simulations
 - Presented research at AGU^{[C.14],[C.19]}, AMS^{[C.12],[C.18]}, and SJSU College of Science Research Day
 - Collaborated with thesis committee post-graduation to publish updated results using CMIP5 model output^[P.4]

- Graduate Assistant (September 2008 – May 2009)
 - Used MATLAB to assist in data analysis of Pacific Decadal Oscillation and coastal fog
 - Graded assignments for undergraduate Global Climate Change class

Applied Weather Technology, Inc. – Sunnyvale, CA

- Route Analyst Technician (January 2010 – May 2012)
 - Mapped routes for ocean vessels based on weather factors, ocean conditions, fuel efficiency, and pirate activity areas
- Weather Data Technician (June 2009 – May 2012)
 - Met strict deadlines for updating weather fronts and tropical storm activity products
 - Drew marine weather fronts on observational analysis and modeled forecast maps
 - Utilized satellite imagery and tropical forecast advisories to update tropical product
 - Trained new personnel in both Weather Data Technician and Position Entry roles
- Position Entry (March 2008 – June 2009)
 - Entered vessel position and weather data from ship master messages into database

NASA Ames DEVELOP / Science Systems and Applications, Inc. – Moffett Field, CA

- Team Lead of Climate Change Group (June – August 2010 & 2011)

Received NASA Group Achievement Award for outstanding support of Agency programs that help the field centers and neighboring communities plan for and adapt to the impacts of climate change

- Research group's point of contact between advisors, mentors, and collaborators
- Delegated responsibilities based on each team member's strengths
- Ensured group produced deliverables well before deadlines
- Presented research at AGU^{[C.16],[C.20]}, AMS^[C.13], ASPRS^[P.5], and NASA Ames Research Center

June 2011 – August 2011:

- Analyzed impacts of climate change on California's various ecosystems
- Supported NASA Ames' goals of water conservation through estimation of potable water used annually for irrigation at NASA Ames Research Center

June 2010 – August 2010:

- Analyzed potential flood risk to NASA Ames under future climate projections
- Collected and formatted meteorological data using WDM Utility
- Used BASINS model to simulate past storm events and create future storm scenarios

NBC Bay Area (KNTV) Weather Center – San José, CA

- Meteorologist Intern (June 2008 – August 2008)
 - Retrieved data from NWS Daily Climate Reports for cities in San Francisco Bay Area
 - Used WSI media software to create on-air Bay Area current day weather maps
 - Forecasted short-term temperatures
 - Created forecast temperature maps to go on-air

Related Activities

Jet Propulsion Laboratory Center for Climate Sciences Summer School:

“Using Satellite Observations to Advance Climate Models” (September 2014)

- One of 24 students fully funded to attend, selected from worldwide applicant pool of 300
- Engaged in fast-paced group project using JPL's EarthKit Lab beta cloud-based web tool
- Analyzed vegetation phenology and climatic controls using MODIS, AIRS, TRMM, and CERES satellite data

Resilience and Adaptation to Climate Change Risks Workshop:

Ames Research Center and Silicon Valley (February 2011)

- Presented the flood risk to NASA Ames Research Center under climate change scenarios
- Collaborated with scientists from NASA, Army Corps of Engineers, and Fish and Wildlife Service to determine mitigation and adaptation steps under projected future climates

SJSU Southwest Monsoon Field Campaign: Flagstaff, AZ (August 2009)

- Collected in situ data of monsoonal activity
- Deployed Mini SODAR, radiosondes, and remote automated weather stations
- Forecasted monsoonal activity and presented forecast briefings
- Analyzed data collected through RAOB and MATLAB software

WxChallenge (Collegiate Weather Forecasting Challenge)

- Spring 2006 – Cumulative Rank 7 Forecaster (Out of approx. 350 competitors)
- Fall 2005 – Cumulative Rank 18 Forecaster (Out of approx. 250 competitors)

Education

***M.S. Atmospheric Sciences* – Texas A&M University, May 2015**

Advisor: Shaima L. Nasiri

Thesis: Vertical Distribution of Cloud Liquid Water and Ice:

A Comparison of MODIS Satellite Observations and the GISS Global Climate Model

***M.S. Meteorology* – San José State University, August 2012**

Advisor: Alison F.C. Bridger

Thesis: Assessment of Water Storage Trends and Distributions in the Mississippi River Basin as Simulated by IPCC Models and Compared to GRACE Satellite Data

***B.A. Radio-Television-Film* – San José State University, August 2007**

Minor: Atmospheric & Seismic Hazards

Select Awards and Recognitions

- 2018: Recognition of support to ICESat-2 mission (NASA Goddard Space Flight Center)
- 2017: Featured in NASA EOSDIS “Who uses NASA Earth Science Data? Data User Profiles”
<https://earthdata.nasa.gov/user-resources/who-uses-nasa-earth-science-data-user-profiles/user-profile-katherine-pitts>
- 2015: Best Student Poster Presentation^[C.7]
(Joint Satellite Program: American Meteorological Society 95th Annual Meeting)
- 2012: NASA Group Achievement Award
- 2012: 2nd Place Student Poster^[C.13]
(24th Conf. on Climate Change and Variability: American Meteorological Society 92nd Annual Meeting)

Memberships

American Meteorological Society, 2008 – present
American Geophysical Union, 2009 – present

Publications and Datasets

- [P.1] Neuenschwander, A.L., S.C. Popescu, R.F. Nelson, D. Harding, **K.L. Pitts**, and J. Robbins (2019). *ATLAS/ICESat-2 L3A Land and Vegetation Height, Version 1*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.5067/ATLAS/ATL08.001>.
- [P.2] Neuenschwander, A., **K. Pitts** (2019). The ATL08 Land and Vegetation Product for the ICESat-2 Mission. *Remote Sensing of Environment*, **221**, 247-259, doi:10.1016/j.rse.2018.11.005.
- [P.3] Neuenschwander, A., **K. Pitts** (2019). Ice, Cloud, and Land Elevation Satellite 2 (ICESat-2) Algorithm Theoretical Basis Document (ATBD) for Land - Vegetation Along-Track Products (ATL08). (Contributors: A. Neuenschwander, S. Popescu, R. Nelson, D. Harding, **K. Pitts**, J. Robbins, D. Pederson, R. Sheridan.)
- [P.4] Freedman, F.R., **K.L. Pitts**, A.F.C. Bridger (2014). Evaluation of CMIP climate model hydrological output for the Mississippi River Basin using GRACE satellite observations. *Journal of Hydrology*, **519(D)**, 3566-3577, doi:10.1016/j.jhydrol.2014.10.036.
- [P.5] **Pitts, K.**, M. Little, M. Lowenstein, L. Iraci, C. Milesi, C. Schmidt, J.W. Skiles. (2012). Climate Adaptation Science Investigation (CASI) at NASA Ames Research Center: Using the Terrestrial Observation and Prediction System (TOPS) to Analyze Impacts of Climate Change on California Ecosystems. Paper presented at 2012 ASPRS Annual Conference, Sacramento, CA, 19-23 March.
- [P.6] **Pitts, K.**, A. Gonzales, M. Lowenstein, L. Iraci, C. Milesi, J.W. Skiles. (2011). NASA Ames Research Center Climate Change Effects and Adaptation Research: Hind- and Forecasting Flood Risk of NASA Ames Research Center using the BASINS Model. Paper presented at 2011 ASPRS Annual Conference, Milwaukee, WI, 1-5 May.

Conference Abstracts and Presentations

- [C.1] **Pitts, K.**, E. Kline, J. Fulbright, M. Seybold (2020). GOES-T and -U Post-Launch Product Testing Plans and Lessons Learned from GOES-R and -S. Abstract presented at 2020 Annual Meeting, AMS, Boston, MA, 12-16 Jan. ([Poster presentation](#))
- [C.2] **Klotz, B.**, A.L. Neuenschwander, **K. Pitts**. (2018). Developing a Global Gridded Vegetation Product for ICESat-2. Abstract presented at 2018 Fall Meeting, AGU, Washington D.C. 10-14 Dec. ([Oral presentation](#))
- [C.3] Battalio, J.M., **M. Herrera**, **K. Pitts**. (2016). Necessity of Convective Parameterization in Simulating MCS Precipitation at High Resolution. Abstract presented at 2016 Annual Meeting, AMS, New Orleans, LA, 10-14 Jan. ([Poster presentation](#))
- [C.4] **Neuenschwander, A.**, **K. Pitts**. (2015). Land and Vegetation Data Products for the ICESat-2 Mission. Abstract presented at 2015 Fall Meeting, AGU, San Francisco, CA 14-18 Dec. ([Oral presentation](#))
- [C.5] **Neuenschwander, A.**, **K. Pitts**. (2015). Potential performance characteristics of ICESat-2/ATLAS for canopy height retrievals in different ecosystems (Invited). Abstract presented at 2015 Fall Meeting, AGU, San Francisco, CA 14-18 Dec. ([Oral presentation](#))
- [C.6] **Dabney, P.**, D. Harding, S. Valett, E. Feliciano, A. Neuenschwander, **K. Pitts**. (2015). Airborne Lidar Measurements of Below-canopy Surface Water Height, Slope and Optical Properties in the Florida Everglades Shark River Slough. Abstract presented at 2015 Fall Meeting, AGU, San Francisco, CA 14-18 Dec. ([Poster presentation](#))
- [C.7] **Pitts, K.**, S.L. Nasiri. (2015). Comparing Vertical Distributions of Cloud Liquid Water and Ice from MODIS Collections 5 and 6 to CMIP5 Model Simulations. Abstract presented at 2015 Annual Meeting, AMS, Phoenix, AZ, 4-8 Jan. ([Poster presentation](#))
- [C.8] **Pitts, K.**, S.L. Nasiri, N. Smith. (2013). Filtering and Gridding Satellite Observations of Cloud Variables to Compare with Climate Model Output. Abstract presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec. ([Poster presentation](#))
- [C.9] Bridger, A.F.C., **F. Freedman**, **K. Pitts**. (2013). Evaluation of CMIP5- and CMIP3-Generation GCM Soil Moisture Predictions against GRACE Terrestrial Water Storage Anomalies for the Mississippi River Basin. Abstract presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec. ([Poster presentation](#))
- [C.10] **Nasiri, S.**, **K. Pitts**, H. Jin. (2013). Cloud Liquid Water and Ice in the Mid-Troposphere: Comparing Observations and Models. Abstract presented at 2013 EUMETSAT Meteorological Satellite Conference, Vienna, Austria, 16-20 Sept. ([Oral presentation](#))
- [C.11] **Pitts, K.**, S.L. Nasiri, P. Yang, N. Smith, A.L. Demko. (2013). Comparison of Suomi NPP VIIRS and EOS MODIS Cloud Retrieval Products Using a Uniform Space-Time Algorithm. Abstract presented at 2013 Annual Meeting, AMS, Austin, TX, 6-10 Jan. ([Poster presentation](#))
- [C.12] **Pitts, K.**, A.F.C. Bridger. (2012). IPCC Simulated Total Water Storage in the Mississippi River Basin: Present and Future. Abstract presented at 2012 Annual Meeting, AMS, New Orleans, LA, 21-26 Jan. ([Poster presentation](#))

- [C.13] **Pitts, K.**, M. Little, M. Lowenstein, L. Iraci, C. Milesi, C. Schmidt, J.W. Skiles. (2012). Impacts of Climate Change on California Ecosystems as Modeled by the Terrestrial Observation and Prediction System (TOPS). Abstract presented at 2012 Annual Meeting, AMS, New Orleans, LA, 21-26 Jan. ([Poster presentation](#))

- [C.14] **Pitts, K.**, A.F.C. Bridger. (2011). Assessment of Future Water Storage in the Mississippi River Basin as Derived from IPCC Models in Comparison with GRACE Observations. Abstract presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. ([Poster presentation](#))

- [C.15] Little, M., **K. Pitts**, M. Lowenstein, L. Iraci, C. Milesi, C. Schmidt, J.W. Skiles. (2011). Using the Terrestrial Observation and Prediction System (TOPS) to Analyze Impacts of Climate Change on California Ecosystems. Abstract presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. ([Poster presentation](#))

- [C.16] **Pitts, K.**, M. Little, M. Lowenstein, L. Iraci, C. Milesi, C. Schmidt, J.W. Skiles. (2011). Using the Terrestrial Observation and Prediction System (TOPS) to Analyze Impacts of Climate Change on Ecosystems within Northern California Climate Regions. Abstract presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. ([Poster presentation](#))

- [C.17] Little, M., **K. Pitts**, M. Lowenstein, L. Iraci, C. Milesi, C. Schmidt, J.W. Skiles. (2011). Using the Terrestrial Observation and Prediction System (TOPS) to Analyze Impacts of Climate Change on Ecosystems within Southern California Climate Regions. Abstract presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. ([Poster presentation](#))

- [C.18] **Pitts, K.**, A.F.C. Bridger. (2011). Assessment of Groundwater Storage Derived from IPCC Models, and Projections for the Next 50 Years. Abstract presented at 2011 Annual Meeting, AMS, Seattle, WA, 22-27 Jan. ([Poster presentation](#))

- [C.19] **Pitts, K.**, A.F.C. Bridger. (2010). Assessment of Groundwater Storage Derived from IPCC Models in Comparison with GRACE Data for the Western US, and Projections for the Next 50 years. Abstract presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec. ([Poster presentation](#))

- [C.20] **Pitts, K.**, A. Gonzales, M. Lowenstein, L. Iraci, C. Milesi, J.W. Skiles. (2010). NASA Ames Research Center Climate Change Effects and Adaptation Research: Hind- and Forecasting Flood Risk of NASA Ames Research Center using the BASINS Model. Abstract presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec. ([Poster presentation](#))

- [C.21] Milesi, C., M. Lowenstein, L. Iraci, N. Burroughs, **K. Pitts**, A. Gonzales. (2010). NASA Ames Research Center Climate Change Adaptation Research. Abstract presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec. ([Poster presentation](#))