

JESSICA V. FAYNE

Tel. (571) 265-9249 | E-mail. JFayne@g.ucla.edu | Web. <http://www.linkedin.com/in/JFayne>
<https://scholar.google.com/citations?hl=en&pli=1&user=YVJ-99wAAAAJ>

EDUCATION

- UNIVERSITY OF CALIFORNIA, LOS ANGELES** - Department of Geography | *Los Angeles, California* Expected Early 2022
Doctor of Philosophy, Geography - Remote Sensing and Hydrologic Modeling
- GEORGE MASON UNIVERSITY** - Department of Geography and Geoinformation Science | *Fairfax, Virginia* May 2015
Master of Science, Geographic and Cartographic Sciences - Remote Sensing and Image Processing
- AMERICAN UNIVERSITY** - School of International Service | *Washington, DC* December 2011
Graduate Certificate in Cross Cultural Communications
- HAMPTON UNIVERSITY** – Department of Political Science | *Hampton, Virginia* May 2010
Bachelor of Arts in Political Science - International Relations and Architecture

WORK EXPERIENCE

- NASA JPL Radar Science and Engineering Visiting Student Researcher- Production and Analysis** September 2017 - Present
NASA JET PROPULSION LABORATORY, Radar Engineering
Worked with the AirSWOT Processing Group to produce interferometrically-derived elevation models and converted the AirSWOT elevation models into GIS-accessible multi-band GeoTIFFs.
Worked with radar and hydrology research groups at JPL to analyze AirSWOT scattering and phenomenology data to in support of the upcoming SWOT mission and future Ka-band instruments
- NASA Terrestrial Information Systems Intern- Analysis of Arctic Ice Cover** June 2017 - Aug 2017
NASA GODDARD SPACE FLIGHT CENTER, Terrestrial Information Systems Laboratory
Mapped Ice Abundance and Melt Pond change using Landsat 5, 7, 8 in the Arctic Beaufort and Chukchi Seas
- Research Associate- Analysis of Oceanic Precipitation** November 2016 – Sept 2017
UNIVERSITY OF MARYLAND BALTIMORE COUNTY, Joint Center for Earth Systems
Technology (JCET) + Applied Remote Sensing Training (ARSET)
Analyzed precipitation measurements from ocean buoy rain gauges
Examined noise characteristics and compared in situ buoy and satellite data from TRMM and GPM
Led in-person remote sensing training introducing satellite precipitation datasets and digital elevation models
- Research Associate- Water Resources** May 2015 - May 2017
UNIVERSITY OF SOUTH CAROLINA, School of the Earth, Ocean and Environment
To produce high spatial- and temporal- resolution water storage maps of a dozen major river basins around the world, I (1) Studied soil moisture, precipitation, and vegetation to determine changes in terrestrial water storage and (2) Developed a method to improve forecasting methods to determine fluctuations in subsurface freshwater
Led in-person remote sensing training introducing satellite precipitation (TRMM/GPM), terrestrial water storage (GRACE), and optical remote sensing datasets (Landsat/MODIS) and supported external projects through data analysis and training
- Geospatial Consultant NASA DEVELOP**
NASA GODDARD SPACE FLIGHT CENTER, Applied Sciences Laboratory September 2014 - Nov 2016
Worked on diverse remote sensing projects focused on mapping natural disasters for to improve prediction models, including: (1) Investigated novel methods of near-real time identification of

landslides in the Himalayas, (2) Created an image compositing method allowing flood maps in South East Asia to be updated twice-daily, and (3) Implemented classification and cluster analysis to identify invasive grass species in the US Northern Plains

NASA Hydrology Intern- Flood Product Validation

June 2014 - Aug 2014

NASA GODDARD SPACE FLIGHT CENTER, Hydrological Sciences Laboratory

Developed a novel technique to validate the NASA Flood Extent Product

HONORS & AWARDS

- Canadian Symposium on Remote Sensing - Best Student Symposium Oral Presentation, 2021**—Third Place (\$250)
- Future Investigators in NASA Earth and Space Science and Technology (FINESST), 2020 -2022**, Three-year graduate fellowship (\$135k)
- AGU Outstanding Student Presentation Award (OSPA), 2019** -- -- Surface Water Detection and Elevation Retrieval from AirSWOT (\$200)
- Earth Science Information Partners Research Incubator, 2018** –Funding for research equipment to build a travelling ground station (\$5k)
- Earth Science Information Partners Fellowship, 2017** –Stipend and attendance at winter and summer ESIP Conferences (\$2k)
- John Mather Nobel NASA Scholarship Award, 2014 + 2017**—Travel allowance to present research at conferences (\$6k total)
- Eugene V. Cota-Robles Fellowship, 2017** –Tuition and Stipend at UCLA for 1st and 4th Year of study. (~\$90k)
- ASPRS Presidential Citation, 2016**—Certificate of Recognition for developing the new ASPRS awards interface and review process
- GEOINT Student Travel Scholarship Award, 2015**—Fees covered for travel and presentation at the GEOINT Conference 2015 (~\$500)
- AGU Student Travel Scholarship Award, 2014**—Travel allowance to present research at the Fall AGU Conference (\$500)
- First Place: ASPRS GeoLeague, 2014**— First Place, Team Prize (\$100)
- Grand Prize: GMU GIS Day Mapping Competition, 2013**—Bike Map (Maps Printed and Widely Distributed)

PEER-REVIEWED PUBLICATIONS (*DENOTES MENTORED PAPER)

- Fayne JV**, and LC Smith. "Characterization of Near-Nadir Ka-Band Scattering From Wet Surfaces," in *IGARSS 2021 - 2021 IEEE International Geoscience and Remote Sensing Symposium*, Jul. 2021, (in press)
- Huang C, LC Smith, Kyzivat ED, **Fayne JV**, Ming Y, Spence C. 2021 "Tracking transient Arctic-Boreal wetland inundation from Sentinel-1 SAR" *International Journal of Applied Earth Observations and Geoinformation*. (in press)
- Pitcher LH, Smith LC, Cooley SW, Zaino A, Carlson R, Pettit J, Gleason CJ, Minear TJ, **Fayne JV**, et al. 2020 "Advancing field-based GNSS surveying for validation of remotely sensed water surface elevation products". *Frontiers in Earth Science*.
<https://doi.org/10.3389/feart.2020.00278>
- Cooper MG, Smith LC, Rennermalm AK, Tedesco M, Muthyala R, Leidman SZ, Moustafa SE, **Fayne JV**. 2020 "First spectral measurements of light attenuation in Greenland Ice Sheet bare ice suggest shallower subsurface radiative heating and ICESat-2 penetration depth in the ablation zone" *The Cryosphere*. <https://doi.org/10.5194/tc-2020-53>
- Fayne JV**, Smith LC, Pitcher LH, Kyzivat ED, Cooley SW, Denbina MW, Chen AC, Chen CW, Pavelsky TM. 2020 "Airborne Observations of Arctic-Boreal Water Surface Elevations from AirSWOT Ka-band InSAR and LVIS LiDAR" *Environmental Research Letters*.
<https://doi.org/10.1088/1748-9326/abadcc>
- Hashemi, H, **Fayne JV**, Lakshmi V, Huffman G. 2020 "Very high resolution, altitude-corrected, TMPA-based monthly satellite precipitation product over the CONUS" *Nature Scientific Data* <https://doi.org/10.1038/s41597-020-0411-0>
- *Tran C, Mora O, **Fayne JV**. 2019 "Unsupervised Classification for Landslide Detection from Airborne Laser Scanning", *Geosciences*
<https://doi.org/10.3390/geosciences9050221>
- Fayne, JV**, Ahamed, A, Roberts-Pierel, J, Rumsey, A. 2019 "Automated Satellite-Based Landslide Identification Product for Nepal" *Earth Interactions* <https://doi.org/10.1175/EI-D-17-0022.1>
- Pitcher LH, Pavelsky TM, Smith LC, Moller DK, Altenau EH, Allen GH, Lion C, Butman D, Cooley SW, **Fayne JV**, Bertram M "AirSWOT InSAR Mapping of Surface Water Elevations and Hydraulic Gradients Across the Yukon Flats Basin, Alaska" *Water Resources Research*
<https://doi.org/10.1029/2018WR023274>
- Kyzivat ED, Smith LC, Pitcher LH, **Fayne JV**, Cooley SW, Cooper MG, Topp SN, Langhorst T, Harlan ME, Horvat C, Gleason CJ, Pavelsky TM. 2019 "A High-Resolution Airborne Color-Infrared Camera Water Mask for the NASA ABoVE Campaign" *Remote Sensing*.
<https://doi.org/10.3390/rs11182163>
- Lakshmi, V, **Fayne, JV**, Bolten, JD. 2018 "A comparative study of available water in the major river basins of the world" *Journal of Hydrology* <https://doi.org/10.1016/j.jhydrol.2018.10.038>

- *Mora, OE, Lenzano MG, Toth CK, Grejner-Brzezinska DA, **Fayne JV**. 2018 "Landslide Change Detection Based on Multi-Temporal Airborne LiDAR-Derived DEMs." *Geosciences: Special Issue of Natural Hazards and Risks Assessment*.
<https://doi.org/10.3390/geosciences8010023>
- Shortridge AM, **Fayne JV**, Rice MT. 2017. "Modeling Uncertainty in Digital Elevation Models." *International Encyclopedia of Geography: People, the Earth, Environment and Technology*. <https://doi.org/10.1002/9781118786352.wbieg1153>
- Fayne JV**, Bolten JD, Doyle CS, Fuhrmann S, Rice MT, Houser Paul, R, Lakshmi V. 2016. "Flood mapping in the lower Mekong River Basin using daily MODIS observations." *International Journal of Remote Sensing*. <https://doi.org/10.1080/01431161.2017.1285503>
- Fayne JV**, Fuhrmann S, Rice MT, and Rice RM. 2015. "Exploring Alternative Map Products To Enhance Transportation Option Awareness." *Cartography And Geographic Information Science* 1-13. <https://doi.org/10.1080/15230406.2015.1053826>.

PEER-REVIEWED PUBLICATIONS IN PROCESS

- Huang H., Fischella M., Liu Y., Ban Z., **Fayne JV**, Li D., Cavanaugh K., Lettenmaier DP. "Limited Changes in mechanisms or intensity of Western U.S. floods over the last half century due to increasing temperatures" *GRL (In Revision)*
- Fayne JV**, Smith LC, Liao T-H, Pitcher LH, Yuan T, Denbina M, Chen AC, Simard M, Chen CW, Williams BA. "Characterizing Water Surface Cover at Ka-band Frequencies for SWOT" *(In Prep)*
- Fayne JV**, Smith LC. "Radar Scattering from Water Surfaces" *(In Advanced Prep)*
- Fayne JV**, Smith LC. "Diverse Utility of Remotely Sensed Water Surface Elevations" *(In Advanced Prep)*
- Fayne, JV**, Scholl, V, Pahlevan N. "Melt Ponds and Thinning Ice in the Arctic Beaufort and Chukchi Seas: Historic Analysis using Landsat Data" *(In Advanced Prep)*
- Fayne, JV**, Lakshmi, V, Giroto, M. "Estimating High Spatial Resolution Terrestrial Water Storage from Surface Observations: A Study of 11 Major River Basins using the GRACE Proxy Global Terrestrial Water Analysis Method" *(In Advanced Prep)*

OTHER PUBLICATIONS

- Ahamed A, Bolten JD, Doyle CS, **Fayne JV**. 2017 "Near real-time flood monitoring and impact assessment systems", *Remote Sensing of Hydrological Extremes* https://doi.org/10.1007/978-3-319-43744-6_6
- Clayton A, **Fayne JV**, Green C, Tomlin J. 2017. "Utilizing NASA Earth Observations to Map Temporal and Spatial Patterns of Annual Bromes for Prairie Management and Invasive Species Control in the Northern Great Plains" Weber, Samantha, ed. *Connections Across People, Place, and Time: Proceedings of the 2017 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites*. Hancock, Michigan: George Wright Society. <http://www.georgewright.org/proceedings2017>
- Fayne JV**, Bolten JD, Lakshmi V, Ahamed A. 2016 "Optical and Physical Methods for Mapping Flooding with Satellite Imagery", *Remote Sensing of Hydrological Extremes* https://doi.org/10.1007/978-3-319-43744-6_5
- Lakshmi, V, Bindlish R, **Fayne JV**, Huffman G, Jackson T, Kirschbaum D, Skofronick-Jackson G, and Yueh S, Mapping the 2015 South Carolina flood using SMAP and GPM, *GEWEX Newsletter*, Vol. 26, No. 2, pp. 6-10, 2016
- Rice MT, Paez FI, Rice RM, Ong EW, Qin H, Seitz CR, **Fayne JV**, Curtin KM, Fuhrman S, Pfoser D, Medina RM. 2014. "Quality Assessment and Accessibility Applications of Crowdsourced Geospatial Data: A Report on the Development and Extension of the George Mason University Geocrowdsourcing Testbed" *Defense Technical Information Center Report* <http://www.dtic.mil/dtic/tr/fulltext/u2/a615952.pdf>
- Rice MT, Curtin KM, Pfoser D, Rice RM, Fuhrman S, Qin H, Vese RD, Ong EW, **Fayne JV**, Paez FI, Seitz CR, Rice MA, Yu M, Ober SJ, Rice CA. 2015. "Social Moderation and Dynamic Elements in Crowdsourced Geospatial Data: A Report on Quality Assessment, Dynamic Extensions and Mobile Device Engagement in the George Mason University Geocrowdsourcing Testbed" *Defense Technical Information Center Report* <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=AD1001943>
- Fayne JV**. 2014. *George Mason University Cloth Bike Map*. Fairfax. George Mason University

PUBLISHED DATASETS

- Kyzivat ED, Smith LC, Pitcher LH, **Fayne JV**, Cooley SW, Cooper MG, Topp S, Langhorst T, Harland ME, Gleason CJ, Pavelsky TM. 2020 "ABoVE: AirSWOT water masks from color-infrared imagery over Alaska and Canada, 2017" *ORNL DAAC*, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1643>
- Fayne JV**, Hashemi H 2019, "High Resolution Altitude Corrected Precipitation based on TMPA and other sources L4 Monthly 1 km x 1 km V1", Edited by David Silberstein, Greenbelt, MD, Goddard Earth Sciences Data and Information Services Center (GES DISC), <https://doi.org/10.5067/8115OXI2F55B>

Fayne, JV, Smith LC, Pitcher LH, and Pavelsky TM. 2019. "ABoVE: AirSWOT Ka-band Radar over Surface Waters of Alaska and Canada, 2017". ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1646>

CONFERENCE PRESENTATIONS (PARTIAL LIST ONLY)

- Fayne JV** et al., Impacts of the atmosphere on Ka-band radar backscatter returns from land and water surfaces, AGU Annual Meeting, New Orleans/Online, December 2021
- Fayne JV** et al., Characterizing AirSWOT Ka-band SAR Backscatter to Support SWOT Surface Water Extent Retrievals, AGU Annual Meeting, New Orleans/Online, December 2021
- Fayne JV** et al., Characterization of Near-Nadir Ka-Band Scattering from Wet Surfaces, IEEE International Geoscience and Remote Sensing Symposium, Brussels/Online, July 2021
- Fayne JV** et al., The Quantification of Near-Nadir Ka-band Surface Scattering Characteristics, 42nd Canadian Symposium on Remote Sensing, Yellowknife/Online, June 2021
- Fayne JV** et al., Changes in mechanisms and intensity of Western US floods, 1960-2013, European Geophysical Union (EGU) General Assembly, Online, April 2021
- Fayne JV** et al., Radar Scattering from Water Surfaces: Introduction to the SWOT Mission, AAG Annual Meeting, Online, April 2021
- Fayne JV** et al., Airborne Observations of Ka-band Radar Backscatter from AirSWOT Enable Vegetation and Water Detection, AGU Annual Meeting, Online, December 2020
- Fayne JV** et al., Airborne observations of Ka-band radar backscatter from AirSWOT enable vegetation and water detection in the Peace Athabasca Delta, 41th Canadian Symposium on Remote Sensing, Yellowknife/Online, June 2020
- Fayne JV** et al., Airborne Arctic-Boreal Water Surface Elevation Observations from AirSWOT Ka-band InSAR and LVIS LiDAR, AGU Annual Meeting, San Francisco, December 2019
- Fayne JV** et al., Building an Operational Network to Validate Novel Inland Water Swath Altimetry, Earth Science Information Partners (ESIP) Winter Meeting, Bethesda MD, January 2019
- Fayne JV** et al., Surface Water Detection and Elevation Retrieval from AirSWOT Airborne Ka-band Radar Interferometry, AGU Annual Meeting, Washington, DC, December 2018
- Fayne JV** et al., Differentiating wetland and open water surfaces using optical and SAR remote sensing, the 39th Canadian Symposium on Remote Sensing, Saskatoon, June 2018
- Fayne JV** et al., Historic Analyses of Thinning Ice and Melt Pond Identification in the Arctic Beaufort and Chukchi Seas, AGU Ocean Sciences Meeting, Portland Oregon, February 2018
- Fayne JV** et al., Updates on AirSWOT Flight Data Processing for SWOT Calibration & Validation, American Society for Photogrammetry and Remote Sensing (ASPRS) – International LiDAR Mapping Forum (ILMF), Denver, February 2018
- Fayne JV** et al., Landslide Detection in the Carlyon Beach, WA Peninsula: Analysis of High Resolution DEMs, AGU Annual Meeting, New Orleans, December 2017
- Fayne JV** et al., Predicting groundwater fluctuations in major global river basins: Case study of California and Mekong River Basins, Baltimore, March 2017
- Fayne JV** et al., Predicting the variability of water resources in eleven global river basins using multivariate and decision tree analysis with satellite data, AGU Annual Meeting, San Francisco, December 2016
- Fayne JV** et al., Decreased Freshwater Storage Leading to the Intrusion of Saltwater and Organic Compounds, AAG Annual Meeting, Boston April 2016
- Fayne JV** et al., Predicting Water Resource Variability in the Major River Basins of the World Using Satellite and Model Data, ASPRS IGTF, Fort Worth TX, April 2016
- Fayne JV** et al., Estimation of Variability in Water Resources in the Major River Basins of the World Using Satellite Data, AGU Annual Meeting, San Francisco, December 2015
- Fayne JV** et al., Real-Time Multi-Scale Mapping for Emergency Management, International Cartographic Conference, Rio de Janeiro, August 2015
- Fayne JV** et al., Validating Flood Mapping Products Using Elevation Model Comparison and Spectral Reflectance, United States Geospatial Intelligence Foundation (USGIF) GEOINT Symposium, Washington DC, June 2015
- Fayne JV** [sole author]. Improving the Longevity of LiDAR Datasets by Defining Potential Areas of Rapid Change, the International LiDAR Mapping Forum (ILMF), Denver, February 2015
- Fayne JV** et al., Validating Flood Mapping Products Using a Digital Elevation Model Comparison Technique, AGU Annual Meeting, San Francisco, December 2014

Fayne JV et al. [team], Mapping Ecosystem Services Change in Coastal Belize Based on Landsat Data, ASPRS Annual Conference, Louisville, March 2014

Fayne JV [sole author]. Indonesia: A Transit Study, George Mason University GIS Day, Fairfax VA, November 2013

FIELD EXPERIENCE

West Oakland Environmental Indicators Project (with UC Berkeley Department of City and Regional Planning), Oakland, California, 2013

SMAP Soil Moisture Active Passive Field Validation Yanco, Australia 2015 (SMAPex-15)

SWOT Surface Water and Ocean Topography Cal/Val Pre-Planning Peace-Athabasca Delta, Alberta, Canada 2018

SWOT Surface Water and Ocean Topography Cal/Val Pre-Planning Peace-Athabasca Delta, Alberta, Canada 2019

UAWSAR, AirSWOT, and SWOT Cal/Val Methods Testing and Marsh Assessment Carpinteria Salt Marsh, California 2018-2019

PROFESSIONAL SERVICE

Review Editor, *Frontiers in Remote Sensing Microwave Remote Sensing* (2021-Present)

Reviewer, *Hydrological Sciences Journal* (2021- Present)

Reviewer, *Applied Meteorology and Climatology* (2021- Present)

Organizer and Chair, *Surface Water Remote Sensing 1 and 2* sessions for the AAG Annual Meeting, February 2022

Co-Organizer and Co-Chair, *Multi-band, Multi-sensor, and Polarimetric Radar Techniques for Permafrost Characterization* session for the IEEE International Geoscience and Remote Sensing Symposium (IGARSS), July 2021

Co-Chair, the *Remote Sensing Applications in Inland Waters II* session for the IEEE IGARSS, July 2021

Organizer and Chair, *Surface Water Remote Sensing I and II* sessions for the AAG Annual Meeting, April 2021

Member, UCLA Geography Task Force on Racial and Gender Equity, Inclusiveness and Support. (June 2020-May 2021)

Reviewer, *MDPI Remote Sensing* (2019-Present)

Member, Disasters Cluster, Earth Science Information Partners (ESIP) (2017-2019)

Community Fellow, Earth Science Information Partners (ESIP) (2017-2019)

Member, Website and Media Working Group, the American Society of Photogrammetry and Remote Sensing (ASPRS) (2016-2018)

Scholarship and Awards Coordinator, the American Society of Photogrammetry and Remote Sensing (ASPRS) (2015-2018)

Chair, Early Career Professional Council, the American Society of Photogrammetry and Remote Sensing (ASPRS) (2016-2018)

Communications Advisor, Early Career Professional Council, the American Society of Photogrammetry and Remote Sensing (ASPRS) (2015-2016)

Organizing Committee Member, ASPRS Potomac Region GeoTech Conference (2015)

Communications Councilor, Student Advisory Council, ASPRS (2013-2015)

OUTREACH AND INCLUSION ACTIVITIES

Guest Lecturer [invited]: Sisters of SAR: 5- Day SAR Remote Sensing Course: "Introduction to Interferometric Synthetic Aperture Radar", August 13, 2021

Letter-writer/Organizer, UCLA Geography Task Force on Racial and Gender Equity, Inclusiveness and Support. (June 2020-August 2020)

Guest Speaker [invited]: Girls in Technology (GIT) Washington, DC Metro Area. "Shining Figures: Women of NASA/ Women in Earth Science and GIS" February 28, 2017

TEACHING AND MENTORSHIP

UNDERGRADUATE RESEARCH

Carolyn Lober, Brown University (June 2021-present)

Caitlin Tran, California State Polytechnic University –Pomona (co-advised with Omar Mora) (2017-2019), now Surveyor at BWE Inc.

TEACHING ASSISTANCE AND GRADING

University of California- Los Angeles, Reader, *Department of Geography GEOG 104 Boundary Layer Climates, Spring Quarter 2020*

University of California- Los Angeles, Teaching Assistant, *Department of Geography GEOG 169 Remote Sensing and GIS, Winter Quarter 2019*

Stanford University, Visiting Lecturer and TA, *Department of Geophysics GEOPHYS 199 Observing Freshwater, Fall Quarter 2015*

PROGRAMMING SKILLS AND SOFTWARE USED

ESRI ARC GIS Suite	MATLAB	Python	AutoCAD Civil3D	Photoshop / GIMP
QGIS / Whitebox GAT	R Programming	3-D Modeling / Visualization	ESRI CityEngine	Blender

Last Updated September 24th, 2021