Christine F. Waigl
Curriculum Vitae

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Education

2017	Ph. D. Geophysics / Remote Sensing, University of Alaska Fairbanks
1994	Diplom Physics (equiv. to M. S.), University of Heidelberg, Germany
1990	Vordiplom exam Physics, University of Erlangen-Nuremberg, Germany

Appointments

Research

2021 - current **Postdoctoral Fellow, International Arctic Research Center, University of Alaska Fairbanks (UAF)**
- Dynamical downscaling of ERA5 climate reanalysis data (WRF modeling) with the Alaska Climate Adaptation Science Center
- Wildfire-related remote sensing and modeling

2019 - 2021 **Postdoctoral Fellow, Geophysical Institute, UAF**
- Remote sensing of boreal wildfire fuels, fire behavior research, and post-fire land cover mapping within the Alaska EPSCoR "Fire and Ice" project
- Processing chain implementation and data engineering for HySpex aerial hyperspectral imagery (ATCOR, PARGE, ENVI; Python, Jupyter Notebooks
- Fieldwork: boreal forest wildfire fuels and ground control locations
- Designed and implemented fire detection and fire hazard related data services (GDAL, Google Earth Engine, ArcGIS platform)

2017 - 2019 **Temporary Research Staff, GI, UAF** (part-time)
- Mapped low- and high intensity active fire from near real-time satellite detections for public communication (Alaska EPSCoR)
- WRF-Chem modeling of wildfire smoke and volcanic ash dispersion
- Fieldwork: surveyed boreal forest vegetation

2012 - 2016 **Graduate Research Assistant, GI Atm. Sciences & Remote Sensing, UAF**
- Algorithm development for satellite-based fire detection for the in Alaska boreal forest
- Fire temperature retrieval in Hyperion imaging spectrometer data (machine learning)
- Atmospheric correction of SWIR, MIR, TIR imagery using MODTRAN
- Fieldwork: airborne remote sensing with FLIR thermal infrared and optical cameras for US Fish and Wildlife Service
- WRF-Chem and WRF-Fire modeling in UAF GI HPC environment

2011 - 2012	**Research Professional 3, GI, UAF**
	• Remote and on-site operations support for DOE Atmospheric Radiation Measurement (ARM) project North Slope of Alaska site (Utqiaġvik)
	• Instrument calibration and data quality
	• Developed and deployed new corrective maintenance database software which is now in use nationally across the ARM program
Summer 2000	**Research Intern, Musée Curie, France** (history of science)
	Created database of women in Marie Curie's laboratory (FileMaker Pro)
1995 - 1998	**Student Research Assistant (scholarship), Laboratoire de Physique Théorique, ENS, France**
	Statistical field theory
1994 - 1995	**Research Assistant, Chemnitz University of Technology, Germany**
	Monte-Carlo optimization (FORTRAN programming)
1990 - 1991	**Student Assistant, IBM Institute for Supercomputing and Applied Mathematics, Heidelberg, Germany**
	Developed stochastic optimization computer code in FORTRAN

Teaching

2018 - 2019	**Adjunct Instructor, College of Natural Science and Mathematics, UAF**
	Fall 2019: NRM F338 "Introduction to Geographic Information Systems"
	Fall 2018: GEOS F436/636 "Beyond the Mouse: Computer Programming and Automation for Geoscientists"
2016 - 2017	**Graduate Teaching Assistant, CNSM, UAF**
	Fall 2016 & Spring 2017: GEOS F120 "Earthquakes, Glaciers, Volcanoes"
2013 - 2020	**Guest lectures and short courses, UAF**
	Multiple guest lectures on fire remote sensing and ground-based visible and infrared spectroscopy in:
	GEOS F422 "Geoscience Applications of Remote Sensing"
	GEOS F458 "Geoscience Applications of GPS and GIS"
	GEOS F654 "Visible and Infrared Remote Sensing"
	October 2015: Co-taught R workshop "Resource Selection Function"
	October 2014: Co-taught GIS workshop to Alaska Dept. of Fish and Game
	March 2014: Course development "Arctic Natural Hazards" for University of the Arctic. Kick-off workshop Arkhangelsk, Russia
2002 - 2004	**Secondary school teacher, Ile-de-France school system, France** (English)
1992 - 1994	**Teaching Assistant, U Heidelberg, Germany** (calculus, linear algebra, physics)

Industry

2010 - 2011	**Client Solutions Engineer, Bazaarvoice Inc., London**
	Implemented client-side product changes (HTML, JavaScript)

2006 - 2010	**Technology Operations Manager/Tech Support Lead, Epsilon, London, UK**

- Led the investigation and resolution of client issues for marketing software platform (T-SQL, Python, HTML, HTTP)
- Line-managed team of 3-8 Technical Support Engineers
- Managed client-facing and internal technology projects including migrations, data extractions and and platform changes (PRINCE II Foundation project management certification)

Student advising

2020 - now	Brooke Kubby (M. S. student, UAF Geoscience (commitee member))
2020 - now	Anushree Badola (Ph. D. student, UAF Geoscience (commitee member))
2021 Summer	Edward Hazelton (intern, Alaska Native Science & Engineering Program)
2013 Summer	Kirsten Stilson (intern, USDA-funded GIS teaching project)
2013 Summer	Akida Ferguson (intern, USDA-funded GIS teaching project)

Publications

Peer-reviewed articles and book chapters

Badola, A., S. K. Panda, D. A. Roberts, C. F. Waigl, U. S. Bhatt, C. W. Smith, and R. R. Jandt (2021b). Hyperspectral Data Simulation (Sentinel-2 to AVIRIS-NG) for Improved Wildfire Fuel Mapping, Boreal Alaska. *Remote Sensing*, vol. 13, no. 9, p. 1693. DOI: 10.3390/rs13091693.

Bhatt, U. S., R. T. Lader, J. E. Walsh, P. A. Bieniek, R. Thoman, M. Berman, C. Borries-Strigle, K. Bullock, J. Chriest, M. Hahn, A. S. Hendricks, R. Jandt, J. Little, D. McEvoy, C. Moore, T. S. Rupp, J. Schmidt, E. Stevens, H. Strader, J. White, C. F. Waigl, A. York, and R. Ziel (2021). Emerging Anthropogenic influences on the Southcentral Alaska Temperature and Precipitation Extremes and Related Fires in 2019. *Land*, vol. 10, no. 1, p. 82. DOI: 10.3390/land10010082.

Döpper, V., S. Panda, C. F. Waigl, and M. Braun (2021b). Using floristic gradient mapping to assess seasonal thaw depth in interior Alaska. *Applied Vegetation Science*. In print. DOI: 10.1111/avsc.12561.

Waigl, C. F., A. Prakash, M. Stuefer, D. Verbyla, and P. Dennison (2019). Fire detection and temperature retrieval using EO-1 Hyperion data over selected Alaskan boreal forest fires. *International Journal of Applied Earth Observation and Geoinformation*, vol. 81, pp. 72–84. DOI: 10.1016/j.jag.2019.03.004.

Starkenburg, D. P., C. F. Waigl, and R. Gens (2018). Chapter 3: Nurturing a Geospatially Empowered Next Generation. In: *Emerging Trends in Open Source Geographic Information Systems*. Ed. by N. N. Srivastava. IGI Global, p. 270. DOI: 10.4018/978-1-5225-5039-6.ch003.

Waigl, C. F., M. Stuefer, A. Prakash, and C. Ichoku (2017). Detecting high and low-intensity fires in Alaska using VIIRS I-band data: An improved operational approach for high latitudes. *Remote Sensing of Environment*, vol. 199, pp. 389–400. DOI: 10.1016/j.rse.2017.07.003.

Waigl, C. F., A. Prakash, A. Ferguson, and M. Stuefer (2015). Chapter 24 - Coal-Fire Hazard Mapping in High-Latitude Coal Basins: A Case Study from Interior Alaska. In: *Coal and Peat Fires: a Global Perspective.* Ed. by E. V. Sokol, G. B. Stracher, and A. Prakash. Vol. 3. Boston: Elsevier, pp. 633–649. DOI: 10.1016/B978-0-444-59509-6.00024-7.

Extended abstracts

Stuefer, M., C. F. Waigl, and C. K. Kim (2014). Alaska wildfire observations and near real-time emission modeling with WRF-Chem. In: *Proceedings of the International Smoke Symposium.* International Smoke Symposium. October 21-24, 2013, Hyattsville, Maryland.

Under review

Badola, A., S. Panda, D. Roberts, C. F. Waigl, R. Jandt, and U. Bhatt (2022). A novel method to simulate AVIRIS-NG hyperspectral image from Sentinel-2 image for improved vegetation/wildfire fuel mapping, boreal Alaska. Manuscript submitted to *International Journal of Applied Earth Information and Geoinformation*, under review.

PhD thesis

Waigl, C. F. (2017b). *Satellite remote sensing of active wildfires in Alaska's boreal forest.* PhD thesis. Fairbanks, AK, USA: University of Alaska Fairbanks.

Presentations and conferences

Conference talks

Waigl, C. F. (2021). Remote sensing of the wildfire environment in Alaska. Talk at the Foundations for Improving Resilience in the Energy Sector Against Wildfires on Alaskan Lands (FIREWALL) Workshop, Sep 15, 2021 (held remotely).

Bhatt, U., J. Chriest, C. Borries-Strigle, P. Bieniek, C. F. Waigl, and C. Smith (2020). EPSCoR seasonal forecast and lightning & remote sensing project updates. Talk the AFSC Spring Fire Science Workshop, Apr 9, 2020.

Waigl, C. F. (2020). Enhancing wildfire resilience in Alaska through landcover mapping with hyper- and multi-spectral remote sensing. Talk at the Tactical Fire Remote Sensing Advisory Committee (TFRSAC) #33 2020 Fall Meeting, Nov 19, 2020 (held remotely).

Waigl, C. F., J. Jenkins, H. Strader, and R. Ziel (2020). Science-to-operations for Alaska wildfire management in times of COVID-19: Usability lessons from rapid data tool development. In: *AGU Fall Meeting Abstracts.* NH036-07. Talk at the 2020 AGU Fall Meeting (held remotely).

Waigl, C. F. (2017a). Improved operational approaches to high- and low-intensity fire detection in Alaska using the VIIRS I-band Fire Detection Algorithm for High Latitudes (VIFDAHL). Talk at the workshop *Opportunities to Apply Remote Sensing in Boreal/Arctic Wildfire Management and Science*, Fairbanks, Alaska, April 5, 2017.

Waigl, C. F., A. Prakash, M. Stuefer, and C. Ichoku (2016). Using NPP-Suomi VIIRS I-band data to delineate high- and low-intensity burn areas for forest fires in interior Alaska. In: *AGU Fall Meeting Abstracts.* GC42C-02. Talk at the 2016 AGU Fall Meeting, San Francisco, CA.

Waigl, C. F. (2015). Data usability in the context of remote sensing data. Talk at the 2015 Summer Meeting of the Federation of Earth Science Information Partners (ESIP), Asilomar, CA, July 15, 2015.

Waigl, C. F., M. Stuefer, G. Grell, and A. Prakash (2013). Refining source input for wildfire emissions forecasts with remote sensing and modeling. Talk at the 2013 ARSC Weather Symposium, Fairbanks, AK.

Selected poster presentations

Badola, A., S. K. Panda, D. A. Roberts, U. Bhatt, C. F. Waigl, and J. R. (2021a). Building a Spectral Library to aid Hyperspectral Data Simulation for Boreal Alaska. In: *AGU Fall Meeting Abstracts*. GC15B-0702. Poster at the 2021 AUG Fall Meeting, New Orleans, Dec 13, 2021 (presented remotely).

Waigl, C. F., M. Stuefer, A. Badola, C. Smith, S. K. Panda, and U. S. Bhatt (2021). Quantitative and Qualitative Insights into Boreal Forest Fire Fuel Type and Condition from Tree-Scale Airborne Imaging Spectroscopy. In: *AGU Fall Meeting Abstracts*. GC15B-0666. Poster at the 2021 AUG Fall Meeting, New Orleans, Dec 13, 2021.

Badola, A., S. Panda, U. Bhatt, C. Smith, and C. F. Waigl (2020). Simulating AVIRIS-NG Hyperspectral Image from Sentinel-2 Multispectral Image for Improved Wildfire Fuel Mapping, Boreal Alaska. In: *AGU Fall Meeting Abstracts*. NH033-0004. Poster at the 2020 AUG Fall Meeting (held remotely).

Prakash, A., M. Buchhorn, J. Cristobal, R. F. Kokaly, P. R. Graham, C. F. Waigl, D. L. Hampton, M. Werdon, N. Guldager, M. Bertram, and M. Stuefer (2015a). Field-Based and Airborne Hyperspectral Imaging for Applied Research in the State of Alaska. In: *AGU Fall Meeting Abstracts*. GC23K-1233. Poster at the 2015 AUG Fall Meeting, San Francisco, CA.

Prakash, A., R. Gens, J. Cristobal, C. F. Waigl, M. S. Balazs, P. R. Graham, C. E. Butcher, and E. B. Sparrow (2015b). Using Place-Based Independent Class Projects as a Means to Hone Research Skills and Prepare a Future Geospatial Workforce. In: *AGU Fall Meeting Abstracts*. ED22B-07. Poster at the 2015 AUG Fall Meeting, San Francisco, CA.

Waigl, C. F., A. Prakash, M. Stuefer, and P. E. Dennison (2014). Fire Characterization and Fire-Related Land Cover Classification Using Hyperion Data over Selected Alaskan Boreal Forest Fires. In: *AGU Fall Meeting Abstracts*. GC33D-0551. Poster at the 2014 AUG Fall Meeting, San Francisco, CA.

Gens, R., A. Prakash, G. Ozbay, S. Sriharan, M. S. Balazs, A. Chittambakkam, D. P. Starkenburg, C. F. Waigl, S. Cook, A. Ferguson, et al. (2013). A Prototype Two-tier Mentoring Program for Undergraduate Summer Interns from Minority-Serving Institutions at the University of Alaska Fairbanks. In: *AGU Fall Meeting Abstracts*. Vol. 1. ED43B-0768.

Waigl, C., M. Stuefer, and A. Prakash (2013). Remote sensing of Alaskan boreal forest fires at the pixel and sub-pixel level: multi-sensor approaches and sensitivity analysis. In: *AGU Fall Meeting Abstracts*. B51H-0399. Poster at the 2013 AUG Fall Meeting, San Francisco, CA.

Waigl, C. F., A. Prakash, and M. Stuefer (2012). Sub-pixel characterization of Alaskan boreal forest fires using medium-resolution satellite-borne infrared remote sensing. In: *AGU Fall Meeting Abstracts*. NH53A-1813. Poster at the 2012 AUG Fall Meeting, San Francisco, CA.

Waigl, C. F., M. Stuefer, B. Perkins, M. Ivey, J. Zirzow, W. Brower, J. Ivanoff, and C. Stuart (2012). NSA Corrective Maintenance Reporting: A Status Report. In: Poster at the ARM Science Team Meeting, Crystal City, VA, March 15, 2012.

Funding awards

2021	AK EPSCoR travel award — $ 2,463
2017	CIFAR Follow-Up Funding (PI/Advisor: Martin Stuefer) — $ 14,046
2013 - 2016	NASA Earth and Space Science Fellowship (PI/Advisor: Martin Stuefer) — $ 90,000
2015	Earth Science Information Partners (ESIP) Federation Robert G. Raskin Scholarship — $ 2,000
2014	UAF Center for Global Change/CIFAR Student Award Competition — $ 9,647.48

Synergistic activities

Science-to-operations: Created data services ready-to-use by the Alaska Fire Service, including for daily snow cover, fire danger and fire detection data, thereby bridging the gap between research and operational use of scientific products.

Communicating science to the wider public Multiple presentations to K-8 students with the UAF portable planetarium (2015-2017). Wildfire presentation to middle and high school students of the village of Rampart (Nov 8, 2019). Science for Alaska lecture March 9, 2021 ("Firewatch: Fire Landscapes from Air and Space"). Authored article in Fairbanks Daily News-Miner June 30, 2015 ("Fairbanks geophysics student goes behind the scenes of satellite wildfire mapping"). Work featured in UAF News June 3, 2020 ("Satellites fill void for wildfire managers amid COVID-19 restrictions"), the Summer 2020 AFSC Fire Science Highlight ("EPSCoR Boreal Fires Team: Remote Sensing for Alaska Fire Season") and a December 2021 Geophysical Institute Research Spotlight ("Hyperspectral imaging of forests can aid wildfire prevention")

Strengthening links between academia and open-source software: I have served for multiple years on US Python Convention program committees and spoken at software conferences (Feb 23, 2019: PyCascades, Seattle, WA; May 18, 2017: PyCon US, Portland, OR; April 26, 2016: OpenVis Conference, Boston, MA; April 18, 2015: PyCon US, Montreal, QC, Canada)

Service

Professional   Recent peer reviewing for the following journals:

- Earth and Space Science (AGU)
- Natural Hazards and Earth System Sciences (EGU)
- Remote Sensing
- Fire
- Forests
- GI Science & Remote Sensing
- Global Change Biology
- ISPRS International Journal of Geo-Information

2017: Served on the organizing committee of the NASA-funded workshop "Opportunities to Apply Remote Sensing in Boreal/Arctic Wildfire Management and Science" organized by the Alaska Fire Science Consortium, Fairbanks, AK, April 3-4, 2017

University	**2020 - now**: Diversity, Equity and Inclusion Committee (UAF GI and IARC)
Community	**2021 - now**: Faculty Advisor for UAF Community Garden

Honors

2018	UAF Geophysical Institute Best Student Paper Award for Waigl et al., 2017
1988 - 1994	German National Merit Foundation (Studienstiftung des deutschen Volkes)
1988 - 1994	Scholarship for highly talented students of the state of Bavaria, Germany

Languages

- German (native speaker)
- English (fluent spoken and written)
- French (fluent spoken and written)