

# Christian Joseph Abys

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## Education

**University of Maryland** *2021-Present*

Ph.D. Geographical Sciences & Remote Sensing

- Professor/Advisor: Sergii Skakun, PhD

**Boston University** *2019-2020*

M.S. Environmental Remote Sensing & Geospatial Sciences

- Projects: Predictive Forest Cover Change, Distributed Solar Energy Grid Modeling

**University of Vermont** *2015 - 2019*

B.S. Environmental Science

- Rubenstein School of Environment and Natural Resources (RESNR)
- Concentration: Environmental Data Assessment & Analysis || Minor: Geospatial Technologies

## Professional Experience

**World Bank Group**, Washington D.C. *April 2023 – January 2024*

Junior Consultant

- Evaluation of European Union Farmer Cash Grant Scheme in Ukraine using remote sensing
- Identify and compute for treated and control parcels relevant vegetation indices and time-varying other variables (climate, soil moisture, evapotranspiration) to be fed into a panel regression model to assess program impact.
- Explore household survey data to assess the correlation of the above indices with farm level yields and on this basis develop an approach to collect parcel-level yield information that can be used for yield prediction.
- Provide input into a paper to provide an early assessment of program impact

**DNext Intelligence SA**, Switzerland *May 2022 – August 2022*

Lead Agriculture Remote Sensing Analyst

- Lead the DNext remote sensing mission for increasing agricultural monitoring capabilities
- Produced winter wheat/crop maps and yield forecasting model for the 2022 Russian wheat harvest that was within 95% of reported harvest
- Developed plan of action and road work for integrating remote sensing data into the DNext platform

**Department of Geographical Sciences**, UMD *August 2021 – Present*

Graduate Research Assistant || Agriculture Data Science

- Research includes studying remote sensing and geoscience applications for investigating large-scale agriculture with a focus on Eastern European
- Research
  - Modeling winter wheat expansion & intensification in Eastern Europe
  - High-frequency yield forecasting models using GOES-16/17 data with high-temporal resolutions for increasing agricultural monitoring capabilities over the US

**Indigo Agriculture**, Boston *January 2020 – August 2020*

Geospatial Analyst Intern || Data Innovation Team

- Conduct geospatial analysis to discover trends and insights in agricultural datasets
- Identify and acquire spatial datasets from municipal, state, federal, and commercial sources and integrate into a unified data platform
- Create maps and visualizations for key stakeholders and decision makers within the organization
  - DEM of research farmland for topography and hydrology analysis
  - Grain supply infrastructure research

- COVID-19 mapping and visualization to provide intelligence

**Vermont Energy Investment Corporation, Vermont**

*May 2019 – August 2019*

Energy Engineer Intern

- Conduct technical, market and regulation research to understand viability of utilizing dairy farm waste to produce combined heat and gas via biodigesters
- Use of Python, R, E-Star, and ArcGIS Pro to process and analyze big data for hotspot location-allocation analysis and energy grid modeling
- Presented research and deliverables to department directors at company symposium

**Spatial Analysis Laboratory, UVM**

*October 2018 – May 2019*

Geographic Information Systems Technician

- Edited, classified and processed satellite/aerial imagery datasets via ArcGIS Pro
- Reviewed and corrected errors in LiDAR, NAIP, and Ortho datasets
- Reviewed coworkers image analysis to ensure quality control

**West Street Parcel Land Management**

*September 2018 – December 2018*

Senior Capstone Project || Vermont Agency of Natural Resources

- Developed a 30-year comprehensive land management plan that will reforest a plot of land with native Pitch Pine and Oak species for the Vermont Agency of Natural Resources
- Devised a realistic, cost-effective reforestation plan with state foresters and scientists
- Used GIS to generate a map of the area to assist in understanding the reforestation area
- Analyzed soil data including moisture content and acidity to determine planting feasibility

**Aiken Forestry Science Laboratory (RESNR), UVM**

*May 2018 – August 2018*

Laboratory Research Intern

- Executed lab procedures including KCl extractions and pH analysis of soil samples
- Measured moisture and nutrient contents of soils

**Sail Caribbean, British Virgin Islands, Tortola**

*Summer 2017 – Summer 2021*

Director of Operations

- Adventure Sailing/Diving Camp
- Organized daily camp schedules/logistics for 150 campers
- Inventory and order supplies from local stores and suppliers

**Nature Conservancy, Block Island, RI**

*June 2013- August 2013*

Field Technician-Rhode Island Chapter

- Assisted Yale graduate students studying the presence of Lyme Disease in tick populations
- Searched for and counted Piping Plover nesting sites; Conducted soil erosion survey
- Extensive removal of invasive species and water-quality sampling

**Skills, Certifications & Coursework**

- Languages: Python, SQL, R, JavaScript
- Software: Scikit-learn, Tensor flow, GDAL, Marxan, QGIS, ArcGIS Business Analyst, ESRI ArcGIS Pro, Imagine ERDAS, Carto, PostgreSQL, Google Earth Engine, Matplotlib, Geopandas
- Wilderness First Responder (2018), PADI Rescue Diver (2017)

**Academic Positions and Teaching**

**World Regional Geography, Boston University**

*Fall of 2019/2020*

Teaching Assistant – Discussion Leader

- Lead discussion groups on various topics concerning the various institutions that shape our modern world
- Manage class and coursework for 40 students via office hours and Blackboard

**Natural History & Field Ecology, University of Vermont**

*Spring of 2018*

Teaching Assistant – Laboratory Leader

## **Conferences, Awards & Miscellaneous**

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**American Geophysical Union Fall 2023 Conference**, San Francisco *December 2023*

- Selected for Oral Presentation on research for mapping winter cereal grains with radar data

**American Geophysical Union Fall 2022 Conference**, Chicago *December 2022*

- Selected for Oral Presentation on research concerning trends in eastern European wheat farming

**Hard Red Winter Wheat Tour 2023**, Kansas *May 2023*

**Hard Red Winter Wheat Tour 2022**, Kansas *May 2022*

- Tour Kansas wheat fields sampling yield and crop conditions
- Designed and built crop-type classification map of Kansas grain using ground-truth samples collected in the field. Presented work to NASA Harvest team

**1<sup>st</sup> Place Carolina Data Hackathon 2021**, UNC-Chapel Hill *October 2021*

- Designed machine learning model that predicted the CDC's Social Vulnerability Index at the town level through isolation of key performance indicators and reduced data dimensionality
- Built a hurricane risk index with satellite data and integrated it with the CDC's Social Vulnerability Index for measuring the impact of major hurricanes on communities along the eastern seaboard of the United States in the past two decades.

## **Publications**

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Abys, C., Skakun, S., and Becker-Reshef, I. (2023). "Two Decades of Russian Winter Wheat Expansion and Intensification" *Remote Sensing Applications: Society and Environment*.

Abys, C., Skakun, S., and Becker-Reshef, I. (2022). "The Rise and Volatility of Russian Winter Wheat Production." *Environmental Research Communications*. (Vol. 4.10).

<https://doi.org/10.1088/2515-7620/ac97d2>

Skakun, S., Abys, C., Adegbenro, M., Becker-Reshef, I., Duncan, E., Eun, J., ... & Prishchepov, A. (2022, December). "High-Impact Hot Spots of Land Cover Land Use Change in Ukraine". In 2022 12th International Conference on Dependable Systems, Services and Technologies (DESSERT) (pp. 1-5). IEEE.

## **Journal Services**

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**IGARRS 2023**, Investigative Paper Reviewer *January 2023*

**IGARRS 2022**, Investigative Paper Reviewer *January 2022*

**Remote Sensing of Environment**, Reviewer *2022-2024*

## **Links**

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LinkedIn Profile

<https://www.linkedin.com/in/christian-abys-876263139/>

University of Maryland Graduate Student Profile

<https://geog.umd.edu/gradprofile/abys/christian>