NAZIFE ORUC BACI

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PROFESSIONAL SUMMARY

Postdoctoral Research Associate specializing in hydrologic and hydrodynamic modeling of flood-driven macroplastic, sediment, and contaminant transport. Developer of FLOTR, a physics-based Lagrangian model for simulating macroplastic transport in overland flow, with experience integrating laboratory experiments and community-scale hydrologic modeling. Skilled in model development and coupling, calibration and validation, sensitivity and uncertainty analysis, and flood-risk assessment.

SKILLS

- **GIS & Modeling Software:** ArcGIS, HEC-RAS, AutoCAD, SMS: PTM, GSSHA
- **Research & Experimentation:** Experimental Design, Field Research, Data Collection
- **Programming:** Python
- **Data Analysis & Statistics:** Statistical Analysis, Data Analysis
- **Scientific Computing & Modeling:** Research and Publication, Analytical Thinking, Problem-Solving

EDUCATION

Ph.D.: ENGR-Environmental, Civil, Agriculture & Mechanic, 05/2026
University of Georgia - Athens, GA

Master of Science: Civil, Construction, and Environmental Engineering, 05/2023
The University of Alabama - Tuscaloosa, AL

M.S. in Civil Engineering: 01/2017
Pamukkale University - Denizli, Turkiye

M.S. in Civil Engineering (Exchange Erasmus student): 01/2015
University of Genoa - Genoa, Italy

Bachelor of Science: Civil Engineering, 09/2013
Pamukkale University - Turkiye

B.S. in Civil Engineering (Exchange Erasmus student): 01/2012

University of Genoa - Genoa, Italy

EXPERIENCES

Postdoctoral Research Associate, 05/2026 – Present

University of Georgia – Athens, GA

- Hydrologic and Hydrodynamic Modeling of Overland Plastic Transport and Riverine Sediment–Contaminant Processes

Graduate Research Assistant, 01/2023 - 05/2026

University Of Georgia – Athens, GA

- Research topic is Inland Litter Hydrodynamics: Characterizing the Litter Transport during Wet Weather Events in Communities

Graduate Research Student, 01/2020 - 12/2022

The University of Alabama – Tuscaloosa, AL

- The thesis work was done on the Cahaba River
- The most important contribution of the study to the literature is the inclusion of the lateral arms in the model
- ArcMap, HEC-RAS and Python were actively used during the thesis.

Research and Teaching Assistant and P.h.D student, 01/2015 - 01/2022

Harran University

- In addition to the work of the department, worked in the field of research and teaching.

Structural Design Engineer, 01/2013 - 01/2015

Ucyıldız Mimarlık-Insaat

- Responsible for the static analysis of static projects such as schools and houses, adhering to architecture.

RESEARCH INTERESTS

- Hydrologic and Hydrodynamic Modeling
- Overland Flooding, Flood Risk, and Compound Flood Events
- Macroplastic and Sediment Transport Processes
- Numerical Modeling, Particle Tracking, and Model Calibration
- Stormwater, Urban Drainage, and Land-to-Ocean Transport Systems

ONGOING RESEARCH

- Advancing Land-to-Ocean Plastic Transport Modeling: A Multi-Scale Approach which is supported by Bantam Materials UK Ltd., the supplier of Prevented Ocean Plastic™ / Bantam Materials UK Ltd
- Assessing Sediment Transport in a Contaminated River due to Extreme Events and Climate Change Impacts, the supplier of Savannah River Ecology Laboratory for Savannah River Mission Completion and the U.S. Department of Energy

SCIENTIFIC ACTIVITIES

Peer-Reviewed Journal Articles

- Oruc Baci, N., Santiago-Collazo, F.L., Jambeck, J.R., 2026. A Physics-Based Modeling Framework for Simulating Macroplastic Transport in Overland Flow. Results in Engineering, 112472. https://doi.org/10.1016/j.rineng.2026.112472
- Oruc Baci, N., Santiago-Collazo, F.L., Jambeck, J.R., 2026. Evaluating macroplastics transport thresholds for overland flow processes. Journal of Hazardous Materials Advances 22, 101200. https://doi.org/10.1016/j.hazadv.2026.101200
- Oruc Baci, N., Santiago Collazo, F., Woodson, C., Jambeck, J., 2025. Advancing Numerical Models for Land-to-Ocean Litter Transport: A Review of Hydrodynamic Processes and Inland Contributions. Science of the Total Environment, 970, 179013. https://doi.org/10.1016/j.scitotenv.2025.179013
- Oruc Baci, N., Jafarzadegan, K., Moradkhani, H., 2023. Improving flood inundation modeling skill: interconnection between model parameters and boundary conditions. Modeling Earth Systems and Environment, 10, 243–257 (2024). https://doi.org/10.1007/s40808-023-01768-5
- GUMUS, V., YENIGUN, K., TOPRAK, Z., ORUC BACI, N., 2018. Sanlıurfa ve Diyarbakır istasyonlarında sıcaklık tabanlı buharlasma tahmininde YSA, ANFIS ve GEP yontemlerinin karsılastırılması. DUMF Muhendislik Dergisi, 9 (1), 553-562.,
- GUMUS, V., BASAK, A., ORUC, N., 2016. Standartlastırılmıs Yagıs Indeksi (SYI) Yontemi ile Sanlıurfa Istasyonunun Kuraklık Analizi. Harran Universitesi Muhendislik Dergisi, 1(1): 36-44.

Software and Research Products

- Oruc Baci, N. (2026). *Force-based Lagrangian Object Transport (FLOTR)* (Version 2.0.0) [Computer software]. Zenodo. https://zenodo.org/records/21416567

Conference Presentations and Abstracts

- Oruc Baci, N., Santiago Collazo, F., Jambeck, J., 2024. Bridging Physical and Numerical Modeling: Transport Drivers of Macro-plastic in Overland Systems. AGU25
- Oruc Baci, N., Santiago Collazo, F., Jambeck, J., 2024. Tracing Plastic Pathways: Laboratory Validation and Sensitivity Insights in Overland Transport Numerical Models. Abstract EGU25-3846
- Oruc Baci, N., Santiago Collazo, F., Bayer, L., Jambeck, J., 2025. A Multi-faceted Approach for Understanding Plastic Transport in Overland Systems: From Physical to Numerical Modeling. AGU24,

- Oruc Baci, N., Santiago Collazo, F., Jambeck, J., 2024. Integrating Numerical Modeling and Fieldwork for Understanding Land-to-Ocean Litter Transport: A Comprehensive Review. EGU General Assembly Conference Abstracts, 6714,
- Oruc Baci, N., Santiago Collazo. F. 2023. Advancements in Hydrodynamic Models for Analyzing Land-to-Ocean Litter Transport: A Review. UGA Water Science & Policy Poster Symposium
- Jafarzadegan, K., Oruc Baci, N., Moradkhani, H., 2022. Advanced flood inundation modeling skills: Improved boundary conditioning and its interconnection with model parameters. AGU Fall Meeting,
- ORUC BACI, N., BACANLI U.G. 2017. Standartlastırılmıs Yagıs Indeksi kullanılarak Meteorolojik Kuraklık: Sanlıurfa Calısması. IMCOFE 2017 / Rome Tam Metin Bildiri Kitabı Cilt-1,310,
- ORUC BACI, N., BACANLI U. G., 2017. Evaluation of Drought in Southeastern Anatolia Region, Turkiye, IMCOFE 2017 / Rome Tam Metin Bildiri Kitabı Cilt-1,328.,
- GUMUS, V., YENIGUN K., TOPRAK Z.F., ORUC BACI, N., 2017. Comparison of YSA, ANFIS and GEP Methods in Temperature-Based Evaporation Estimation in Sanlıurfa and Diyarbakır Stations. IX. National Hydrological Congress, Diyarbakır-Turkiye.

Projects

- BACANLI U.G., ORUC BACI, N., 2017. Drought Analysis in the Southeast Anatolia Region. BAP Project, No: 2016FEBE021., -VIII. National Hydrology Congress (08-10 October 2015) Congress Officer, -International VI. Gap Engineering Congress (23- 25 October 2018) Congress Officer

Technical Reports

- Santiago-Collazo, F. L., Viloria-Marimon, O. M., Oruc Baci, N., Lin, P., 2026. Assessing Sediment Transport in a Contaminated River due to Extreme Events and Climate Change Impacts. Savannah River Ecology Laboratory Technical Report SREL2026-0001. Prepared by the University of Georgia for Savannah River Mission Completion and the U.S. Department of Energy.

Thesis/Dissertation

- Oruc Baci, Nazife, 2026, “Advancing Overland Macroplastic Transport: A Multi-Modeling Approach Integrating Experiments and Urban Hydrodynamic.” Ph.D. Dissertation, University of Georgia, Athens, GA
- Oruc Baci, Nazife, 2023, "Impacts of Lateral Flows on the Calibration of 2D- Flood Inundation Models." M.S. Thesis, University of Alabama, Tuscaloosa, AL
- Oruc Baci, Nazife, 2017, "Guneydogu Anadolu Bolgesinde Kuraklik Analizi." M.S. Thesis, University of Pamukkale, Denizli, Turkiye

TEACHING EXPERIENCE

University of Georgia, 2026-

University of Harran, 2025-2020

Courses and Laboratories Taught

- Hydraulic Laboratory Experiments and Analysis
- Water Resources Engineering I
- Computer Aided Water Structures Design
- Hydraulic
- Water Structures I
- Introduction to Civil Engineering
- Multidisciplinary Integrated Project
- Capstone project

Commissions Served At The Department

- Graduation Commission
- Student Vertical Transfer Commission
- Student Transfer Commission
- Exam Program Preparation Committee
- Internship Commission
- Erasmus Commission
- Exemption Commission
- Student Counseling

Awards, Accomplishments, and Honors

- Awarded the College of Engineering Excellence in Graduate Research Award (2026)
  University of Georgia, College of Engineering —Awarded for outstanding graduate research; based in part on publication in *Science of the Total Environment*:
  "Advancing numerical models for land-to-ocean litter transport: A review of hydrodynamic processes and inland contributions"
- Awarded the Charles James Moore Prize for Outstanding Research on Plastic Pollution (2025)
- Selection and placement of students to be sent for graduate education abroad (YLSY)- Turkish Ministry of National Education Fellowship 2017-2022
- Graduated as Honor Student in accordance with the relevant article of the Regulation (2013)

Service

- Secretary, Environmental & Water Resources Institute—Georgia Chapter, 2025–Present.
- President, University of Georgia Turkish Student Association, 2025–Present.
- The University of Alabama Turkish Student Association 2020-2022
- Contemporary Life Support Association 2009-2013 (Awarded scholarship)
- TEMA Youth Member

Languages

Turkish

Native/ Bilingual

English

Professional

Social Activities

- Traveling to different countries and experiencing different cultures
- Photography
- Extreme sports
- Painting
- Hiking

References

References available upon request.