Abdou Khouakhi, Ph.D.

✉ a.khouakhi@lboro.ac.uk 🐦 @ab_khouakhi 🏠 Oxford, UK
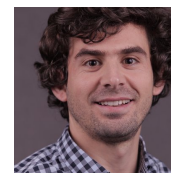🔗 https://orcid.org/0000-0002-1224-3208
○ https://github.com/khouakhi 🌐 https://khouakhi.netlify.com/
Ⓟ https://publons.com/researcher/1318013/abdou-khouakhi/

Employment History

2017 – ···· 🔖 **Research Associate,** Loughborough University, School of Architecture, Building and Civil Engineering, UK.

- Developing an early-warning system for flood forecasting using a network of wireless sensors and machine learning.
- Involves: field work, some project management, grant writing, helping students, teaching occasionally, and contributing to workshops and seminars.

2015 – 2017 🔖 **Postdoctoral Research Scholar,** IIHR- Hydroscience & Engineering, University of Iowa, USA.

- Hydro-climatological research investigating the drivers of extreme events at the global scale.
- Involved: environmental data mining, statistics, grant writing, helping students, teaching, and contributing to workshops and seminars.

2013 – 2015 🔖 **Research Assistant,** European PEGASO Project (*People for Ecosystem based Governance in Assessing Sustainable development of Ocean and coast*), http://www.pegasoproject.eu/

- Project geo-spatial analyst and research assistant.

2011 – 2012 🔖 **Consultant,** Mediterranean Action Plan: (CAMP-Morocco project), http://www.pap-thecoastcentre.org/

- Cartography and development of the project GIS database.

2010 🔖 **Junior Consultant,** IUCN MedR-Alboran-Morocco project, http://www.uicnmed.org/medras

- Development of the project GIS database.

Education

2008 – 2013 🔖 **Ph.D. in coastal hazards, Faculty of Science, Rabat, Morocco, with several research secondments in Géosciences Montpellier – University of Montpellier, France.**
Thesis title: *Contribution to the development of scientific tools to support Integrated Coastal Zone Management (ICZM) in the Moroccan Mediterranean.* More details at https://toubkal.imist.ma/handle/123456789/9974

2006 – 2008 🔖 **M.Sc. Geoscience, Faculty of Science, Rabat** in Coastal environments.
Thesis title: *Assessment of the risk of coastal flooding due to sea level rise and storm surges (Moroccan Atlantic). First Class Honours.*

2003 – 2006 🔖 **B.Sc. (Hons) Geology and Geo-computation,** Polydisciplinary Faculty of Taza, Earth science department, Morocco

Research Publications

Journal Articles

1 Slater, L. J., Thirel, G., Harrigan, S., Delaigue, O., Hurley, A., Khouakhi, A., ... Smith, K. (2019). Using R in hydrology: A review of recent developments and future directions. *Hydrology and Earth System Sciences Discussions*, 1–33. doi:10.5194/hess-2019-50

2 Khouakhi, A., Ian, P., de la Cruz Jesus, L., Oliver, M.-C. & Miguel, M. (2019). (accepted subject to minor revision) Tropical cyclone-induced flash flooding in Colima, Western Mexico. *Journal of Climatology, Manuscript JOC-19-0064.*

3 Khouakhi, A., Villarini, G., Zhang, W. & Slater, L. (2019). (accepted subject to major revision), Seasonal predictability of high sea level frequency along the U.S. West coast. *Advances in Water Resources, ADWR-2018-317.*

4 Slater, L. J. & Khouakhi, A. (2019). (accepted subject to minor revision), The response of river channel morphology to modes of climate variability. *Scientific Reports, SREP-19-03555.*

5 Khouakhi, A., Villarini, G. & Vecchi, G. A. (2017). Contribution of tropical cyclones to rainfall at the global scale. *Journal of Climate, 30*(1), 359–372.

6 Villarini, G., Khouakhi, A. & Cunningham, E. (2017). On the impacts of computing daily temperatures as the average of the daily minimum and maximum temperatures. *Atmospheric Research, 198*, 145–150.

7 Khouakhi, A. & Villarini, G. (2016a). Attribution of annual maximum sea levels to tropical cyclones at the global scale. *International Journal of Climatology.*

8 Khouakhi, A. & Villarini, G. (2016b). On the relationship between atmospheric rivers and high sea water levels along the us west coast. *Geophysical Research Letters, 43*(16), 8815–8822.

9 Khouakhi, A., Niazi, S., Raji, O. & El Fahchouch, A. (2015). Vulnerability assessment of seawater intrusion using hydro-geological indices in moroccan mediterranean aquifers. *International Journal of Hydrology Science and Technology, 5*(2), 133–148.

10 Khouakhi, A., Snoussi, M., Niazi, S. & Raji, O. (2013). Vulnerability assessment of al hoceima bay (moroccan mediterranean coast): A coastal management tool to reduce potential impacts of sea-level rise and storm surges. *Journal of Coastal Research, 65*(sp1), 968–973.

11 Raji, O., Niazi, S., Snoussi, M., Dezileau, L. & Khouakhi, A. (2013). Vulnerability assessment of a lagoon to sea level rise and storm events: Nador lagoon (ne morocco). *Journal of Coastal Research*, (SPEC. ISSUE 65), 802–807.

12 Snoussi, M., Niazi, S., Khouakhi, A. & Raji, O. (2011). Climate change and sea-level rise: A gis-based vulnerability and impact assessment, the case of the moroccan coast. *Geomatic Solutions for Coastal Environments*, 275–310.

13 Snoussi, M., Ouchani, T., Khouakhi, A. & Niang-Diop, I. (2009). Impacts of sea-level rise on the moroccan coastal zone: Quantifying coastal erosion and flooding in the tangier bay. *Geomorphology, 107*(1-2), 32–40.

Books and Chapters

1 Snoussi, M. (Ed.). (2010). Contribution to the report *gestion intégrée de la zone côtière du rif central : Rapport de synthèse final.* %
https://www.pap-thecoastcentre.org/pdfs/WEB%20Rapport%20Final%20GIZC.pdf

Teaching

Disciplines
- Coastal processes and land forms
- Climatology
- Hydrology
- Geomorphology
- Sedimentology
- Geology (structural,quaternary)

Methods
- Computational tools for Earth science (e.g. programming)
- Statistics and geo-statistics
- Reproducible research
- R for data analysis and spatial data
- Python for earth system data
- GIS (software and programming)
- Remote sensing and Earth Observation

Skills

Languages
- Strong reading, writing and speaking in English, French, Arabic and Berber.

Coding
- Fluent Python, R, LaTeX.

Data science
- Proficient in data analysis/ big data handling/ data mining (structured and unstructured data using R and Python)
- Geographic data science (geocomputation: GIS, QGIS, GRASS, R and Python)
- Machine learning/deep learning algorithm development
- Visualization (ggplot2, matplotlib, Shiny, leaflet, dygraphs, plotly, networkD3, rbokeh, rcharts…)
- Parallel computing and high-performance computing
- Hadoop tools
- Database SQL queries
- Computer-aided design (Illustrator, Photoshop, Flash, MapPublisher)
- Interactive web mapping and geographical content management systems
- Numerical modelling (e.g. SWAN model)
- Linux, OSX, Windows

Field skills
- Previous field experience in: Morocco, USA, Mexico, Brazil, Algeria, UK, France
- Design and deployment of environmental wireless sensor networks
- Quantitative and qualitative field analysis
- Mapping/cartography techniques
- Geomorphological/geological survey
- LiDAR, DGPS, hand-held GIS, inclinometry, theodolite
- Full UK, American and Moroccan driving licenses

Miscellaneous Experience

Awards and Achievements

July 2015 — **Fulbright grant (3 months)**, Visit to the Center of Applied Coastal Research, at the University of Delaware, Delaware, USA.

Sept 2013 — **DAAD-EXCEED summer school grant**, Coastal erosion and management for safer coasts in a changing climate (CEMSAC). Recife, Brazil.

Aug 2012 — **Summer Institute on Earth-Surface Dynamics**, NSF-funded National Center for Earth-Surface Dynamics, fully-funded participant; University of Minnesota, USA.

Oct 2012 — **Ninth International Medcoast Training**, Integrated Coastal Management in the Mediterranean and the Black Sea. Dalyan, Aegean Coast, Turkey.

March 2012 — **Ocean Teacher Academy Training course**, Marine GIS applications using ArcGIS organized by the UNESCO/IOC project office for IODE. Oostende, Belgium.

June 2011 — **FORM-OSE Post-graduate Training School**, Coastal hazard assessment and risk management, University of Caen Basse-Normandie, France.

Recent talks/presentations

April 2019 — **Khouakhi A.,** Pattison I., Systematic assessement of multiple machine learning/deep learning approaches for short range flood level prediction. *EGU General Assembly, Vienna, Austria.*

August 2018 — **Khouakhi A.,** Pattison I., A comparative evaluation of multiple machine learning approaches for short range flood level prediction. *EWIN project workshop, Colima Mexico.*

April 2018 — **Khouakhi A.,** Tersteeg R., Data manipulation using R-Tidyverse. *Brown bag seminar, Loughborough University, UK.*

May 2017 — **Khouakhi, A.,** Big data and data science in geosciences. *Invited talk, Faculty of Sciences, Rabat, Morocco.*

Dec 2017 — **Khouakhi, A.,** Villarini, G., Zhang, W., Slater, L., Seasonal predictability of high sea level frequency using Niño3.4 along the U.S. West coast. *AGU fall meeting, New Orleans, USA.*

Dec 2016 — **Khouakhi, A.,** and Villarini, G., On the relationship between atmospheric rivers and high sea water levels along the U.S. West Coast. *AGU fall meeting, San Francisco USA.*

April 2016 — **Khouakhi, A.,** and Villarini, G., Contribution of tropical cyclones to rainfall at the global scale. *EGU General Assembly, Vienna, Austria.*

March 2015 — **Khouakhi, A.,** and Villarini, G., Attribution of annual maximum sea levels to tropical cyclones at the global scale. *AGU fall meeting, San Francisco USA.*

Service

- Founding member of the Moroccan Association of Geomaticians.
- Member of Loughborough research Hub committee

Professional memberships

- American Geophysical Union
- European Geosciences Union
- British Hydrological Society
- Iowa Informatics Initiative