

Abdou KHOUAKHI**Address:** Oxford, UK**Email:** a.khouakhi@Lboro.ac.uk**Webpage:** <https://khouakhi.netlify.com/>

- *Hydro-climatology*
- *Marine and coastal management*
- *Earth system data science*
- *Machine learning for geosciences*
- *Data visualization*
- *Data mining & Statistics*
- *Geographic data science*

PROFESSIONAL EXPERIENCE

- Currently:** Research associate at Loughborough University, School of Architecture, Building and Civil Engineering, UK.
- *Developing models/systems to monitor river water level in real time using remote water sensing over cellular phone systems.*
 - *Wireless sensors*
 - *Machine learning*
- 2015-2017:** Postdoctoral research scholar, IIHR- Hydrosience & Engineering, University of Iowa, USA
- *Climate, weather and environmental data analysis*
 - *Extreme sea levels / rainfall / temperature*
 - *Flood risk analysis*
 - *Coastal Tropical cyclones / atmospheric rivers*
 - *Data mining and statistics*
- 2013-2015:** Project manager in the National Mutual Aid Government department in Morocco
- *Updating the Human Resources Database Management System*
 - *Developing cooperation with associations and NGOs*
- 2010-2014:** Research assistant for PEGASO Project (People for Ecosystem Based Governance in Assessing Sustainable Development of Ocean and Coast) FP7-ENV.2009.2.2.1.4, <http://www.pegasoproject.eu/>
- *Geospatial analyst and mapping*
- 2009-2011:** Consultant PAP/RAC (Mediterranean Action Plan): (CAMP-Morocco). <http://www.pap-thecoastcentre.org/>
- *Cartography and Development of a GIS database*
- 2011-2012:** Junior GIS Consultant for Agriconsulting Maroc S.A.
- *Development of a GIS database within the project Development of a strategy for marine protected areas (MPAs) for fisheries in Morocco*
- 2010:** Junior IUCN Consultant (Project MedR-Alboran-Morocco), <http://www.uicnmed.org/medras>
- *GIS Database for the Project*

EDUCATION

- 2008-2013:** **Ph.D. in Geoscience (coastal environments)**, Faculty of Science, Rabat Morocco.
- *Dissertation:* Contribution to the development of scientific tools to support Integrated Coastal Zone Management (ICZM) in the Moroccan Mediterranean.
 - *Key elements:* Coastal vulnerability Index to flooding and erosion, Coastal setback line for erosion, sustainability indicators.
- 2006-2008:** **Masters in Coastal management**, Faculty of Science, Rabat Morocco
- *Dissertation:* Assessment of the risk of coastal flooding due to sea level rise and storm surges (Coast of Mohammedia, Moroccan Atlantic).
 - *Key elements:* IPCC sea level rise scenarios, GIS modelling, wind waves.
- 2003-2006:** **Bachelors in Geology and Geomatics**, Polydisciplinary Faculty of Taza, Morocco.

GRANTS AND AWARDS

- **Fulbright grant (3 months)** to visit The Center of Applied Coastal Research, at the University of Delaware, Delaware, USA, (July 2015).
- **DAAD-EXCEED summer school grant:** Coastal erosion and management for safer coasts in a changing climate (CEMSAC). Recife, Brazil, (September 2013).
- **Summer Institute on Earth-Surface Dynamics** (SIEDS, NSF-funded National Center for Earth-Surface Dynamics, fully-funded participant); University of Minnesota, USA, August (2012)
- **Ninth International Medcoast Training** (grant) on Integrated Coastal Management in the Mediterranean and the Black Sea. Dalyan - Aegean Coast - Turkey, (October 2012).
- **Ocean Teacher Academy Training course:** Marine GIS applications using ArcGIS organized by the UNESCO/IOC project office for IODE. Oostende, Belgium (March 2012).
- **FORM-OSE Post-graduate Training School** 'Coastal hazard assessment and risk management', University of Caen Basse-Normandie – France (June 2011).
- **International training workshop:** Science in Digital society, Lisbon (May 2011).
- **Training on "Science Communication for Public Debate"** at the Joint Research Center (JRC) of the European Commission, Ispra, Italy (July 2010)
- **Best Master's thesis** in the department of Geosciences 2008, Faculty of Science, Rabat

IT SKILLS

Technical skills

- Data analysis/ Big data/ Data mining (Structured and unstructured data using R and Python)
- Geographic data science (combined GIS, R and Python techniques)
- Machine learning techniques (i.e. classification, clustering, regression, ANN and deep learning)
- Visualization (ggplot2, matplotlib, Shiny, leaflet, dygraphs, plotly, networkD3, rbokeh, rcharts...)
- Parallel computing and high-performance computing (HPC)
- Hadoop tools
- Proficient in GIS (i.e. Arcgis, Qgis, Grass gis)
- SQL queries
- Integrated computer-aided design (ArcGIS, Illustrator, Photoshop, Flash, MapPublisher...)
- Interactive web mapping and geographical content management systems
- Some experience in Simulating Waves Nearshore (SWAN) model
- Linux, OSX, Windows
- Netica application for decision networks
- Good knowledge of SDI (Spatial Data Infrastructure)

Field skills

- Quantitative and qualitative field analysis
- Mapping/cartography techniques
- Geomorphological survey
- Geological survey
- LIDAR, DGPS, hand-held GIS
- Inclinator, theodolite
- Full UK and American driving licenses

Management

- Founding member of the Moroccan Association of Geomaticians.
- Founding of the Leo club (Lions club parent organization)
- Responsible for a team of 14 people for a database construction project for human resources management within the Moroccan department of Mutual Aid
- Member of Loughbrough research Hub committee

PUBLICATIONS AND COMMUNICATIONS

Peer-reviewed journals (ongoing, under review, published)

- **Khouakhi A**, Pattison I, (*in prep.*) A comparative evaluation of multiple machine learning approaches for short range flood level prediction (will be presented in AGU 2018).
- **Khouakhi, A**, Pattison I, López-de la Cruz J, Mendoza-Cano O, Martínez, (*submitted*) Tropical cyclone- induced flash flooding in Colima, Western Mexico. *Int. J. Climatol.*
- L. J. Slater and **A. Khouakhi** (*in prep. for Nature Geoscience*); The response of river channel morphology to modes of climate variability.
- Villarini, G., **Khouakhi, A.**, (2017), On the Impacts of Computing Daily Temperatures as the Average of the Daily Minimum and Maximum Temperatures. *Atmospheric Research*. <https://doi.org/10.1016/j.atmosres.2017.08.020>
- Raji, O., Dezileau, L., Niazi, S., Von-Grafenstein, U., & **Khouakhi, A.**, (*Under review*). Extreme rainfall events over the last 500 years at the Nador region (Morocco). *Bull. Inst. Sci., Rabat*.
- **Khouakhi A.**, Villarini G. (2017): Contribution of tropical cyclones to rainfall at the global scale. *Journal of climate*. DOI: <http://dx.doi.org/10.1175/JCLI-D-16-0298.1>
- **Khouakhi, A.**, and Villarini, G. (2016), On the relationship between atmospheric rivers and high sea water levels along the U.S. West Coast, *Geophys. Res. Lett.*, 43, doi: 10.1002/2016GL070086. <http://doi.wiley.com/10.1002/2016GL070086>
- **Khouakhi, A.**, and Villarini, G. (2016), Attribution of annual maximum sea levels to tropical cyclones at the global scale. *Int. J. Climatol.* doi:10.1002/joc.4704. <http://doi.wiley.com/10.1002/joc.4704>
- **Khouakhi, A.**, Niazi, S., Raji, O., & Fahchouch, A. N. E. (2015). Vulnerability assessment of seawater intrusion using hydro-geological indices in Moroccan Mediterranean aquifers. *Int. J. of Hydrology Science and Technology*, 5(2), 133-148. <http://dx.doi.org/10.1504/IJHST.2015.070087>
- El fahchouch A.N, Ait brahim L., Raji O. & **Khouakhi A.** (2015). Apport du SIG et de la télédétection dans la modélisation spatiale de la susceptibilité aux mouvements de terrain dans la région d'Al Hoceima (Rif Oriental, Maroc)». *Afrique Science*, Vol.11, N°2. <http://www.afriquescience.info/document.php?id=4613>. ISSN 1813-548X
- **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*, 1(65), 968. <http://dx.doi.org/10.2112/SI65-164.1>
- 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*, 65(sp1), 802-807. <http://dx.doi.org/10.2112/SI65-136.1>
- **Khouakhi, A.**, Snoussi, M., Niazi, S., & Raji, O. (2013). Le Système d'Information Géographique (SIG) : un outil pour l'évaluation des terres à risque d'inondation côtière liée aux changements climatiques: Cas du littoral de Mohammedia. *Bull. Inst. Sci., Rabat*,

Série géologie et géographie physique N°:23 (2012).

- 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, Elsevier, 107(1), 32-40.*
<http://dx.doi.org/10.1016/j.geomorph.2006.07.043>

Books and book chapters

- Snoussi M., Niazi S., **Khouakhi A.**, and Raji O., (2010): A GIS-Based Vulnerability and Impact Assessment, The case of the Moroccan Coast In: Maanan M. & Robin M. (dir.) *Geomatic solutions for coastal environments*. Nova Science Publishers.
- Contribution to the report *Gestion Intégrée de la Zone Côtière du Rif central : Rapport de synthèse final. The central Rif*. CAMP Morocco Project.
<http://www.papthecoastcentre.org/pdfs/WEB%20Rapport%20Final%20GIZC.pdf>

Presentations

- **Khouakhi A.**, Pattison I, A comparative evaluation of multiple machine learning approaches for short range flood level prediction. *EWIN project workshop, August 2018, Colima Mexico.*
- **Khouakhi A.**, Tersteeg R, Data manipulation using R-Tidyverse. *Brown bag seminar, Loughborough University, UK, April 2018.*
- **Khouakhi A.**, Tersteeg R, Machine learning and wireless water sensors. *Water day, Loughborough University, UK, June 2018.*
- **Khouakhi, A.**, Big data and data science in geosciences. *Invited talk, May 2017, Faculty of Sciences, Rabat, Morocco.*
- **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 2016, San Francisco USA,*
- **Khouakhi, A.**, and Villarini, G., Contribution of tropical cyclones rainfall at the global scale. *EGU General Assembly 2016, Vienna, Austria.*
- **Khouakhi, A.**, and Villarini, G., Attribution of annual maximum sea levels to tropical cyclones at the global scale. *AGU fall meeting 2015, San Francisco USA,*
- **Khouakhi, A.**, Snoussi, M., Niazi, S., & Raji, O., Vulnerability assessment of Al Hoceima bay (Moroccan Mediterranean coast): a coastal management tool to reduce potential impacts of sea-level rise and storm surges. *12th International Coastal Symposium (ICS 2013), Plymouth University, UK, 8-12 April 2013.*
- **Khouakhi, A.**, Snoussi, M., Niazi, S., & Raji, O. Le Système d'Information Géographique (SIG) : un outil pour l'évaluation des terres à risque d'inondation côtière liée aux changements climatiques: Cas du littoral de Mohammedia. *Rencontre Internationale des Sciences Géomatiques, 8-9 April 2013, Faculté des Sciences, Rabat, Morocco.*
- **Khouakhi, A.**, Snoussi, M. Set back lines for coastal erosion in Al Hoceima bay (Moroccan Mediterranean). *Conference "Relation man / Environment". Algeria, 06-09 June 2011.*
- **Khouakhi, A.**, Snoussi, M. *Fourth European Conference on Coastal Lagoon Research, Research and Management for the Conservation of Coastal Lagoon Ecosystems, South - North comparisons, Montpellier, France, 14-18 December 2009.*

OTHER

Professional memberships

- Iowa informatics initiative
- American of Geophysical Union (AGU)
- Iowa Flood Center (IFC)

- British hydrological society
- Moroccan association of Geomaticians (founding member)
- Moroccan coastal community (MCC) founder
- Association of Young Researchers of the Faculty of Sciences of Rabat (founding member)
- Leo FSR, Rabat (Lions club parent organization) (founding member)

Communication skills

- Mother tongues: Berber
- Fully fluent in French, English, Arabic
- Experience in teaching (GIS, remote sensing and R programming classes for Earth science students)
- Good report-writing and presentation skills (as a consultant)

