

**Sustainable Water Management  
Doctoral Programme (Water4All)**



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<b>Title of the PhD Project</b>	Investigation of the Impact of the Expected Change in the Climate over Water Resources Availability over Reservoirs of Türkiye
<b>Acronym</b>	AQUACHANGE
<b>Research Fields of the Project</b>	Climate Science, Hydrology and Water Resources, Policy and Governance, Sustainability Studies, International Relations and Transboundary Water Issues
<b>Keywords</b>	Water Resources, climate change, hydrological modeling
<b>Host Institution, Department and Campus Location</b>	Middle East Technical University, Civil Engineering Department, Ankara
<b>PhD Awarding Institution and Graduate Programme</b>	Middle East Technical University, Engineering Faculty/Graduate School of Applied and Natural Sciences
<b>Name and Affiliation of Main Supervisor</b>	Prof. Dr. M. Tugrul Yilmaz, Civil Engineering Department, Middle East Technical University
<b>Name and Affiliation of Co-Supervisors</b>	Assoc. Dr. Koray K. Yilmaz, Geological Engineering Department, Middle East Technical University  Prof. Dr. İsmail Yücel, Civil Engineering Department, Middle East Technical University
<b>Research Environment and Infrastructure</b>	PhD candidate will have access to the research infrastructure available at Middle East Technical University and Water Resources Laboratory, including access to high performance computing systems (e.g. ULAKBIM).



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<p><b>Scientific Context of the Project</b></p>	<p>This project assumes great significance when considered within the context of Türkiye's susceptibility to the adverse effects of climate change, particularly in regions influenced by the Mediterranean climate. The Mediterranean region, known for its unique climate patterns, is increasingly vulnerable to the impacts of climate change, including rising temperatures, altered precipitation regimes, and more frequent extreme weather events. Against this backdrop, the study becomes pivotal in unraveling the specific repercussions of climate change on water resources in Türkiye, a nation where the Mediterranean climate plays a prominent role in shaping environmental dynamics.</p> <p>The investigation addresses the urgent need to comprehend how changing climate conditions will manifest in alterations to water availability in Türkiye's reservoirs, which are indispensable for supporting agriculture, sustaining ecosystems, and meeting the water and energy demands of a growing population. The Mediterranean climate's sensitivity to climate change intensifies the challenges faced by Türkiye, making it imperative to adopt proactive measures. By focusing on water resource management in this context, the study aims to provide tailored insights and adaptive strategies that can help mitigate the impacts of climate change on water availability in Türkiye's Mediterranean climate-influenced regions. The findings from this research are not only relevant at a local and national level but also contribute valuable knowledge to the broader international discourse on addressing the climate-induced vulnerabilities of regions with similar climatic characteristics.</p>
<p><b>Brief Workplan</b></p>	<p>Literature Review to conduct an extensive review of existing literature on the Mediterranean climate, climate change impacts, and water resource management in Türkiye.</p> <p>Data Collection to gather historical and projected climate data for the Mediterranean region of Türkiye and collect past hydrological data related to reservoirs, including water levels, inflow, and outflow.</p> <p>Hydrological Modeling to utilize hydrological models to simulate the impact of climate change on water resources and reservoirs. Calibrate models using historical data and validate against observed hydrological patterns.</p> <p>Scenario analysis to evaluate multiple climate change scenarios to understand the range of potential impacts on water availability. Assess the resilience of Türkiye's reservoirs to different climate change scenarios.</p>

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	<p>Impact Assessment to quantify the expected changes in water availability in Türkiye's reservoirs under different climate scenarios.</p> <p>Documentation and reporting to compile research findings into a comprehensive report. Prepare presentations for scientific conferences, workshops, and stakeholder meetings.</p> <p>Publication and Knowledge Dissemination to submit research findings to peer-reviewed journals for publication. Disseminate results through various channels, including academic publications and public outreach.</p>
<b>Innovative Aspects of the Project</b>	Integrated Climate and Hydrological Modeling, Mediterranean Climate Focus, and Scenario Analysis for Reservoir Resilience.
<b>Training Opportunities of the Project</b>	The project can provide opportunities for training about hydrological modeling and/or climate modeling in important operational research centers.
<b>Interdisciplinary Aspects</b>	The topic of the project is directly relevant with climate science, hydrology and water resources, policy and governance, sustainability studies, international relations and transboundary water issues studies.
<b>Intersectoral Mobility</b>  <input type="checkbox"/> Short Visit  <input type="checkbox"/> Secondment	TBD
<b>Intersectoral Mobility</b>  <input type="checkbox"/> Short Visit	TBD



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<input type="checkbox"/> Secondment	
International Academic Secondment	TBD

Main Supervisor										
Brief CV	<p><b>Prof. Dr. M. Tuğrul YILMAZ</b></p> <p>E-mail: <a href="mailto:tuyilmaz@metu.edu.tr">tuyilmaz@metu.edu.tr</a></p> <p><b>Academic Degrees</b></p> <table><tr><td>Ph.D.</td><td>Earth System Sciences, George Mason University, USA</td><td>2011</td></tr><tr><td>M.Sc.</td><td>Earth Systems, Vrije University Amsterdam, Türkiye</td><td>2005</td></tr><tr><td>B.Sc.</td><td>Civil Engineering, Middle East Technical University, Türkiye</td><td>2003</td></tr></table> <p><b>Professional Networks</b></p> <p>Google Scholar: <a href="https://scholar.google.com/citations?user=ogpRhhlAAAAJ&amp;hl=tr&amp;oi=ao">https://scholar.google.com/citations?user=ogpRhhlAAAAJ&amp;hl=tr&amp;oi=ao</a></p> <p>ResearchGate: <a href="https://www.researchgate.net/profile/M-Yilmaz-7">https://www.researchgate.net/profile/M-Yilmaz-7</a></p> <p>Scopus: <a href="https://www.scopus.com/authid/detail.uri?authorId=57191906140">https://www.scopus.com/authid/detail.uri?authorId=57191906140</a></p> <p>ORCID: <a href="https://orcid.org/0000-0001-5094-1878">https://orcid.org/0000-0001-5094-1878</a></p>	Ph.D.	Earth System Sciences, George Mason University, USA	2011	M.Sc.	Earth Systems, Vrije University Amsterdam, Türkiye	2005	B.Sc.	Civil Engineering, Middle East Technical University, Türkiye	2003
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Co-supervisors										

<b>Brief CV</b>	<p><b>Assoc. Prof. Dr. Koray K. YILMAZ</b></p> <p>E-mail: <a href="mailto:yilmazk@metu.edu.tr">yilmazk@metu.edu.tr</a></p> <p><b>Academic Degrees</b></p> <p>Ph.D. Hydrology and Water Resources, Univ. of Arizona, USA 2007</p> <p>M.Sc. Geological Engineering, Middle East Technical University, Türkiye 1999</p> <p>B.Sc. Geological Engineering, Middle East Technical University, Türkiye 1996</p> <p><b>Professional Networks</b></p> <p>Google Scholar: <a href="https://scholar.google.com.tr/citations?user=olbhvrYAAAAJ&amp;hl=tr&amp;oi=ao">https://scholar.google.com.tr/citations?user=olbhvrYAAAAJ&amp;hl=tr&amp;oi=ao</a></p> <p>ResearchGate: <a href="https://www.researchgate.net/profile/Koray-Yilmaz-5">https://www.researchgate.net/profile/Koray-Yilmaz-5</a></p> <p>Scopus: <a href="https://www.scopus.com/authid/detail.uri?authorId=56568516600">https://www.scopus.com/authid/detail.uri?authorId=56568516600</a></p> <p>ORCID: <a href="http://orcid.org/0000-0002-6244-8826">http://orcid.org/0000-0002-6244-8826</a></p>
<b>Brief CV</b>	<p><b>Prof. Dr. İsmail YÜCEL</b></p> <p>E-mail: <a href="mailto:iyucel@metu.edu.tr">iyucel@metu.edu.tr</a></p> <p><b>Academic Degrees</b></p> <p>Ph.D. Hydrology, The University of Arizona, USA 2001</p> <p>M.Sc. Hydrology, The University of Arizona, USA 1996</p> <p>B.Sc. Meteorological Engineering, İstanbul Technical University, Türkiye 1993</p> <p><b>Professional Networks</b></p> <p>Google Scholar: <a href="https://scholar.google.com/citations?user=RGHnI3YAAAAJ">https://scholar.google.com/citations?user=RGHnI3YAAAAJ</a></p> <p>ResearchGate: <a href="https://www.researchgate.net/profile/Ismail-Yucel-2">https://www.researchgate.net/profile/Ismail-Yucel-2</a></p> <p>Scopus:</p>

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