

Kareem Mahmoud TONBOL

Professor of Physical Oceanography and Climatology

Dean of Scientific Research for Maritime Affairs,

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: ktonbol@gmail.com**URL** : <http://www.aast.edu/cv.php?ser=84150>**Scopus Author ID** : <https://www.scopus.com/authid/detail.url?authorId=56109158200>**Research ID** : <http://www.researcherid.com/rid/O-7027-2015>**ORCID ID** : <http://orcid.org/0000-0003-3615-3466>**Skype** : ktonbol**EDUCATION**

2004 – 2008 : Ph.D. in Physical Oceanography, Faculty of Science, Alexandria University, Alexandria, Egypt.
Thesis entitled “Hydrographic Structure and Circulation Patterns of the Southeast Sector of the Mediterranean Sea.”

2001 - 2004 : M.Sc. in Physical Oceanography, Faculty of Science, Alexandria University, Alexandria, Egypt.
Thesis entitled “Deep and Shallow Water Waves in Front of the Egyptian Mediterranean Coast (Damietta Area).”

1999 - 2000 : Pre-Master Advanced Courses in Physical Oceanography, Faculty of Science, Alexandria University, Alexandria, Egypt.

1994 - 1998 : B.Sc. in Mathematics and Physical Oceanography, Faculty of Science, Alexandria University, Alexandria, Egypt.

Administrative Leadership Positions:

1. Dean of Scientific Research for Maritime Affairs, Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, August 2023 – Present.
2. Vice Dean for Postgraduate Studies and Scientific Research, College of Maritime Transport & Technology (CMTT), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, December 2021 – July 2023.
3. Head of Meteorology & Hydrographic Survey Program, College of Maritime Transport & Technology (CMTT), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, October 2012 – November 2021.

Academic Positions:

1. Professor of Physical Oceanography and Climatology, College of Maritime Transport & Technology (CMTT), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, June 2023 – Present
2. Associate Professor of Physical Oceanography and Climatology, College of Maritime Transport & Technology (CMTT), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, August 2018 – May 2023.

3. Assistant Professor of Physical Oceanography and Climatology, College of Maritime Transport & Technology (CMTT), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, October 2012 – July 2018.
4. Assistant Professor of Physical Oceanography and Climatology, Institute of Maritime Upgrading Studies, Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt, December 2008 – October 2012.
5. Assistant Professor of Physical Oceanography and Climatology, Oceanography Department, Faculty of Science, Alexandria University, Alexandria, Egypt, September 2008 – November 2008.

Expertise and Research Focus

Expertise: University leadership and management; maritime affairs; maritime, and ocean sciences leadership; strategic vision and business planning; development and fund-raising.

Research Focus: Physical oceanography, climate change impacts on coastal systems, sea-level rise, sea surface temperature, air temperature, maritime transport, environmental protection, meteorological and oceanographic data analysis, climate and ocean modeling, and integrated coastal zone management.

Reviews:

1. Manuscripts: Reviewed manuscripts submitted for publication to peer-reviewed scientific journals.
2. Proposals: Reviewed project proposals submitted for funding to the Academy for Scientific Research and Technology (ASRT), Egypt.
3. External/Internal Examiner at MSc and Ph.D. Defenses: Have served as the external/internal examiner on dissertations for M.Sc. students.

Teaching: I have taught more than 2,000 students in undergraduate and postgraduate courses and classes during my professional career at several universities.

Supervision and Mentoring: Served as major professor and directed and supervised to completion 2 Ph.D. and 3 M.Sc. dissertations.

Ph.D. Students Supervised:

1. Ahmed Khedr. 2019. Sea Level Modeling and Realization of Lowest Astronomical Tide (LAT) for Alexandria Harbor, Egypt. Maritime Postgraduate Studies Institute (MPI), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt.
2. Mohamed Elbessa. 2022. Downscaling of Climatic Trends and Weather Variability along the Egyptian Mediterranean Coast. Maritime Postgraduate Studies Institute (MPI), Arab Academy for Science, Technology & Maritime Transport (AASTMT), Alexandria, Egypt.

M.Sc. Students Supervised:

1. Adham Torky. 2023. Assessment of Seafarers' Climate Change Awareness, Opinions, and Actions.
2. Elen Aziz. 2023. Macroalgae is a low-cost, industrially feasible, effective, eco-friendly approach, sustainable bio-adsorbent for the removal of toxic dyes from aqueous solution and biological activities toward the achievement of Sustainable Development Goals.
3. Adel ELSayed. 2023. The Impact of Biostimulants Application: Nano Chitosan and Blue-Green Algae Extract (*Spirulina Platensis*) in Enhancing Heat Stress Resilience of Tomato During Flowering Stage Due to Climate Changes.
4. Mennatullah Faheem. 2023. Impacts of climate change and COVID-19 on women: Case Study Kafr El-Shaikh Governorate, Egypt in light of Climate Justice.
5. Ragaa Ahmed. 2023. Spatial-Temporal Monitoring of Groundwater Quality at the Northeast Coast of Alexandria City with Emphasis on the Impact of Climate Change.

6. Walaa Zhran. 2023. A novel insight into climate change issue after COVID-19 lockdown.

Grants and Projects: Have obtained research funding for 13 different projects from local agencies, international institutions, and private foundations, as either principal or co-principal including:

1. Local Fund:

- 1.1. The AASTMT Principal Investigator of an ARCA project funded by the IDRC-Canada, entitled “Downscaling Sea level rise in the Mediterranean Sea under different future climate change scenarios (2065-2100). May 2016 – Feb 2017 (10 months) for 59,000 EGP.
- 1.2. The AASTMT Principal Investigator of an AASTMT project funded by the AASTMT entitled “Threats of sea-level rise and saltwater intrusion to Nile delta aquifer, consideration climatic flooding scenarios”. May 2017 – April 2018 (12 months) for 100,000 EGP.
- 1.3. The AASTMT Principal Investigator of an ARCA project funded by the IDRC-Canada entitled “Downscaling atmospheric components over Egypt under different future climate change scenarios (2065-2100)”. Oct 2017 – Jul 2018 (10 months) for 85,000 EGP.
- 1.4. The AASTMT Principal Investigator of an AASTMT project funded by the AASTMT entitled “Carbon Stock Assessment of Mangrove Forests along the Red Sea Coast of Egypt: Towards Climate Change Mitigation (Blue Carbon)”. October 2021 – September 2022 (12 months) for 333,335 EGP.
- 1.5. The AASTMT Principal Investigator of an AASTMT project funded by the AASTMT entitled “Carbon Footprint Estimation and Reduction in the AASTMT Campus Towards developing a Model for Promoting Sustainable Development Goals (Green Campus)”. October 2021 – September 2022 (12 months) for 260,500 EGP.

2. Regional Fund:

- 2.1. A member of the project funded by the Research and Development Office, Ministry of Education, KSA, entitled “CAPACITY BUILDING FOR CLIMATE CHANGE MITIGATION AND ADAPTATION IN KSA”. October 2019 – September 2022 (36 months) for 1,787,474.00 SAR.
Partners: (KSA) Northern Border University (NBU), Arar, KSA – (USA) Department of Civil, Architectural, and Environmental Engineering, Department of Engineering Management and Systems Engineering, Missouri University of Science and Technology, USA – (Egypt) Arab Academy for Science, Technology and Maritime Transport, EGYPT.

3. International Fund:

- 3.1. A member of the team of Erasmus+ 2017 project funded by the European Union, entitled “Climate Change Management through Mitigation and Adaptation / (AdapTM),” Project no. (585917-EPP-1-2017-1-ITEPPKA2-CBHE-JP), 15th October 2017-14th October 2020 for 770.788,00 Euro to develop a master's program in Environmental Science.
Partners: (Italy) University of Catania (UNICT) – (Lithuania) Klaipeda University (KU) – (Slovenia) Euro-Mediterranean University (EMUNI). From Egypt: Arab Academy for Science and Technology and Maritime Transport (AASTMT) - Suez Canal University (SCU) - South Valley University (SVU) - Alexandria University (AU).
- 3.2. A member of the team of Erasmus+ 2019 project funded by the European Union, entitled “Knowledge exchange in sustainable Fisheries management and Aquaculture in the Mediterranean region / (FishAQU)”, Project no. (610071-EPP-1-2019-1-PTEPPKA2-CBHE-JP), 15th November 2019-14th October 2022 for 719.066,00 Euro, to develop a master program in Fisheries management and aquaculture.
Partners: (Portugal) University of Aveiro (UAVR) – (Italy) University of Palermo (UNIPA) – (Croatia) University of Dubrovnik (UNIDU) - (Slovenia) Euro-Mediterranean University (EMUNI). From Egypt: Alexandria University (AU) -

Arab Academy for Science and Technology and Maritime Transport (AASTMT) - Aswan University (ASWU) - Matrouh University - MAU.

- 3.3. A member of the team of the Erasmus+ 2020 project funded by the European Union, entitled “INtegration of sustainable deVeLopment goaLs in uniVeRsities for better climate change management / (INVOLVE)”, Project no. (619313-EPP-1-2020-1-EG-EPPKA2-CBHE-JP), 15th November 2020-14th October 2023 for 836.594,00 Euro.
Partners: (Egypt) Alexandria University (AU), (Slovenia) Euro-Mediterranean University (EMUNI), (Portugal) University of Aveiro (UAVR) – (Italy) Università degli studi di Sassari (UNISS) – (Spain) Universitat Politècnica de Valencia (UPV), (Egypt) Arab Academy for Science and Technology and Maritime Transport (AASTMT), (Egypt) Heliopolis University for Sustainable Development (HU), (Egypt) Zewail City of Science and Technology (ZC).
- 3.4. A member of the team of ENI CBC MED 2020 project funded by the European Union, entitled “MEDiterranean QUadruple helix Approach to Digitalisation / (MED-QUAD),” Project no. (B_A.2.1_0088), August 2020 for 30 months for 3,297,835.23 Euro, with 469,809.18 EUR budget allocated to AASTMT. Partners: Greece, Italy, Egypt, Jordan, Palestine, Tunisia.
- 3.5. A member of the team of the IAMU Research Project for Young Academic Staff in FY2022, funded by the International Association of Maritime Universities (IAMU), entitled “The Impact of Greenhouse Gas Emissions due to Marine Port Activities on the City Air Quality, Toward the Achievement of SDG’s,” Project no. YAS20220202, May 2022, for 12 months for 18,504 USD.
- 3.6. A member of the team of the PRIMA project funded by the European Union, Section II entitled “Increasing Resilience of Smallholders with Multi-Platforms Linking Localized Resource Sharing / (RESILINK)”, June 2022 for 48 months for 3,414,502 Euro, with 138,100 EUR budget allocated to AASTMT. Partners: France, Algeria, Morocco, Egypt.
- 3.7. A member of the team of the HORIZON project funded by the European Union, entitled “Climate-smart, ecosystem-enhancing and knowledge-based rural expertise and training centers / (RURALITIES),” August 2022 for 60 months for 5,095,500 Euro, with 38,750 EUR budget allocated to AASTMT. Partners: 54 participants from 33 Countries (13 Countries from the EU and 20 countries from Africa), and AASTMT is number 21.
- 3.8. A member of the team of the Erasmus+ 2023 project funded by the European Union, entitled “Curriculum Development for the Sustainable Blue Economy Study toward the achievement of Ocean Decade in Tunisia, Egypt, and Jordan / BLUE-ERA,” Project no. (101128861), February 2024 - February 2027 for 836.594,00 Euro.
Partners: (France) UNIVERSITE DU LITTORAL (ULCO) – (Greece) PANEPITIMIO AIGAIU (U. AEGEAN) – (Italy) UNIVERSITA DEGLI STUDI DI PALERMO (UNIPA). From Egypt: Arab Academy for Science and Technology and Maritime Transport (AASTMT) - Alexandria University (AU). From Tunisia: University of Sousse (US) - UNIVERSITY OF MONASTIR (U. MONASTIR). From Jordan: UNIVERSITY OF JORDAN (UJ) - AL-ALBAYT UNIVERSITY (AAUB).
- 3.9. A member of the team of Erasmus+ 2023 project funded by the European Union, entitled “Curriculum Development for the Sustainable Blue Economy Study toward the achievement of Ocean Decade in Tunisia, Egypt, and Jordan / (BLUE-ERA),” Project no. (101128861), 1st November 2023-1st November 2026 for 705.885,00 Euro to develop a master's program in Blue Economy.
Partners: (France) University of the Littoral Opal Coast (ULCO) – (Greece) University of the Aegean (UAEG) – (Italy) University of Palermo (UNIPA). From Egypt: Arab Academy for Science and Technology and Maritime Transport

Publications

- 1- Salama, N. M., **Tonbol, K.**, ElKut, A., & Kotroni, V. (2024): A comprehensive study on changes in coastal hydrodynamics associated with cyclonic activity. *Sci Rep* 14, 11680 (2024). <https://doi.org/10.1038/s41598-024-58575-w>.

- 2- Noufal, Ahmed Saad; Torky, Adham; and **Tonbol, K.** (2023) "Assessment of awareness regarding climate change between seafarers towards SDGs achievement," *Blue Economy: Vol. 1: Iss. 2, Article 2*. <https://doi.org/10.57241/2805-2986.1006>

- 3- Salama, N. M., Cai, R., & **Tonbol, K.** (2023). Assessing SimCLIM climate model accuracy in projecting Southern Levantine basin air temperature trends up to 2100. *Scientific Reports*, 13(1), 1-35. <https://doi.org/10.1038/s41598-023-46286-7>.

- 4- Tan, H., Cai, R., Bai, D., Hilmi, K., & **Tonbol, K.** (2023). Causes of 2022 summer marine heatwave in the East China Seas. *Advances in Climate Change Research*. <https://doi.org/10.1016/j.accr.2023.08.010>

- 5- Youssef, E. E., Beshay, B. Y., **Tonbol, K.**, & Makled, S. O. (2023). Biological activities and biosorption potential of red algae (*Corallina officinalis*) to remove toxic malachite green dye. *Scientific Reports*, 13(1), 1-14. <https://doi.org/10.1038/s41598-023-40667-8>

- 6- Khaled, A., Abdel-Razik, A., & **Tonbol, K.** (2023). Enhancing Heat Stress Resilience of Tomato During Flowering Stage Using Biostimulants: Nano Chitosan and *Spirulina platensis* Extract. *Journal of Agricultural Chemistry and Biotechnology*, 14(7), 79-87. doi: 10.21608/jacb.2023.213204.1055

- 7- Bkour Alrawashdeh, K. A., K., K., A., J., Al Bsoul, A., Damsheh, R. A., Khasawneh, A., Dessouky, Y., **Tonbol, K.**, Ali, B. M., & Youssef, E. E. (2023). The Effects of Nanoparticles- Zerovalent Iron on Sustainable Biomethane Production through Co-Digestion of Olive Mill Wastewater and Chicken Manure. *Fermentation*, 9(2), 183. <https://doi.org/10.3390/fermentation9020183>

- 8- El-Geziry, T.M.; Elbessa, M.; **Tonbol, K.** (2023). On the Relationships between Sea Surface Temperature and Atmospheric Conditions over the Southern Levantine Basin. *Egyptian Journal of Aquatic Biology and Fisheries*, 27(1), 203-216. doi: 10.21608/ejabf.2023.284714

- 9- **Tonbol, K.**; Khedr, A.; Wahba, M.; Helmy, M.; Elbessa, M. (2023). Evaluating the Accuracy of ERA5 Wave Reanalysis with In Situ Data on the Egyptian Mediterranean Coasts, *Egyptian Journal of Aquatic Biology and Fisheries*, 27(1), pp. 85-107. DOI: 10.21608/EJABF.2023.282647.

- 10- Bawadekji, A.; **Tonbol, K.**; Ghazouani, N.; Becheikh, N.; Shaltout, M. (2022) Statistical Downscaling of Global Climate Projections over Tabuk city, Northwest of Saudi Arabia. *Arab J Geosci* 15, 1269 (2022). <https://doi.org/10.1007/s12517-022-10492-w>

- 11- Elbessa, M.; Mesbah, S.M.; **Tonbol, K.**; Shaltout, M. (2022). Modeling the future scenarios for surface temperature and wind regime over the South-Eastern Levantine Basin, Egypt. *Egyptian Journal of Aquatic Biology and Fisheries*, 26(3), 541-564. doi: 10.21608/ejabf.2022.244114

- 12- Bawadekji, A., Tonbol, K., Ghazouani, N., Becheikh, N., & Shaltout, M. (2022). Recent atmospheric changes and future projections along the Saudi Arabian Red Sea Coast. *Scientific Reports*, 12(1), 1-19. <https://doi.org/10.1038/s41598-021-04200-z>

- 13- ElBessa, M., Abdelrahman, S. M., Tonbol, K., & Shaltout, M. (2021). Dynamical Downscaling of Surface Air Temperature and Wind Field Variabilities over the Southeastern Levantine Basin, Mediterranean Sea. *Climate*, 9(10), 150. <https://doi.org/10.3390/cli9100150>

- 14- Bawadekji, A., Tonbol, K., Ghazouani, N., Becheikh, N., & Shaltout, M. (2021). General and Local Characteristics of Current Marine Heatwave in the Red Sea. *Journal of Marine Science and Engineering*, 9(10), 1048. <https://doi.org/10.3390/jmse9101048>
- 15- El-Geziry, T.M., Elbessa, M. & Tonbol, K.M. Climatology of Sea–Land Breezes Along the Southern Coast of the Levantine Basin. *Pure Appl. Geophys.* 178, 1927–1941 (2021). <https://doi.org/10.1007/s00024-021-02726-x>
- 16- El Bawab, M.; **Tonbol, K. (2021)**. Legal Regime of Climate Change and Impact of International Maritime Transport Industry on Oceans and Marine Life. *Smart Environment and Climate Change Management*, 124–137.
- 17- Khedr, A.; Abdelrahman, S.; **Tonbol, K. (2021)**. Recent Sea Level and Tidal Characteristics in Alexandria Western Harbour, Egypt. *Smart Environment and Climate Change Management*, 109–123.
- 18- **Tonbol, K.M.**, El-Geziry, T.M. & Elbessa, M. Assessment of weather variability over Safaga harbour, Egypt. *Arab J Geosci* 12, 805 (2019). <https://doi.org/10.1007/s12517-019-4974-z>
- 19- Shaltout, M.; **Tonbol, K. (2018)**. Downscaling Global Climate Models: The Case of Egypt. Working Paper No. 6, Alexandria Research Center for Adaptation to Climate Change (ARCA). January 2018. DOI: 10.13140/RG.2.2.24806.52801.
- 20- Khedr, A.; Abdelrahman, S.; **Tonbol, K. (2018)**. Sea Level Characteristics Referenced to Specific Geodetic Datum in Alexandria, Egypt. *Proceedings of the 20th International Conference on Sea Level Rise Analysis and Past Changes (ICSLRAPC)*, 19-20 February, Paris, France. 12 (2): 73-81. urn:dai:10.1999/1307-6892/10008544.
- 21- **Tonbol, K.M.**, El-Geziry, T. M., & Elbessa, M. (2018). Evaluation of changes and trends in air temperature within the Southern Levantine basin. *Weather*, 73(2), 60-66. <https://doi.org/10.1002/wea.3186>
- 22- **Tonbol, K.**; and El-Geziry, T.M. (2015). The Daily SST Variations within the South-Eastern Mediterranean Sea. *Proceedings of the Twelfth International Conference on the Mediterranean Coastal Environment (MEDCOAST 15)*, 06-10 October, Varna, Bulgaria. 2: 1005-1016.
- 23- Shaltout, M., **Tonbol, K.**, & Omstedt, A. (2015). Sea-level change and projected future flooding along the Egyptian Mediterranean coast. *Oceanologia*, 57(4), 293-307. <https://doi.org/10.1016/j.oceano.2015.06.004>
- 24- **Tonbol, K.**; Shaltout, M. (2013). Tidal and non-tidal sea level off Port Said, Nile Delta, Egypt. *JKAU: Mar. Sci.*, 24 (2): 69-83. doi: 10.4197/Mar. 24-2.5.
- 25- Shaltout, M.; **Tonbol, K. (2013)**. Long Term Variation of Water Exchange Through Gibraltar Strait Based on Sea Level Observations of Ceuta and Gibraltar: Building Information for Modeling Thermohaline Structure in the Mediterranean Basin. *JKAU: Mar. Sci.*, 24 (2): 39-67. DOI: 10.4197/Mar. 24-2.4.
- 26- Shaltout, M.; **Tonbol, K. (2011)**. Modeling of wave propagation off Damietta - Port Said Coast, Egypt. *Bull. AIN Journal*, 27: 56-67.
- 27- Sharaf El Din, S.H.; Eid, F.M.; Ibrahiem, O.M.; **Tonbol, K. (2007)**. Hydrographic Variations in the deep and shallow areas of the Egyptian Mediterranean Coast. *Proceedings of the IUGG XXIV*, 2–13 July, Perugia, Italy.
- 28- Eid, F.M.; Sharaf El Din, S.H.; Ibrahiem, O.M.; **Tonbol, K. (2007)**. Circulation Patterns of South East Sector of the Mediterranean Sea. *Proceedings of the MEDCOAST 05*, 25–29 October, Kusadasi, Turkey.
- 29- Alam El-Din, K.A.; Sharaf El-Din, S.H.; **Tonbol, K. (2004)**. Currents in front of Manzalah Lake, Egypt. *Egyptian Journal of Aquatic Research*, 30 (A): 121-141.

EXTRACURRICULAR ACTIVITIES

Accomplishments as Head of Meteorology & Hydrographic Survey Program, CMTT, AASTMT, included:

1. Establishment of an environmental monitoring & climate changes lab for education & research purposes at the CMTT (2018-2023).
2. Preparation of self-report submitted to International Hydrographic Organization (IHO), Monaco, for accreditation of CAT-B Program offered by the College of Maritime Transport & Technology, Arab Academy for Science, Technology & Maritime Transport (2016).
3. Preparation of self-report submitted to Central Evaluation and Accreditation Agency (ZEVA), Hannover, Germany, for accreditation of B. Sc. Programs offered by the College of Maritime Transport & Technology, Arab Academy for Science, Technology & Maritime Transport (2016).
4. Installation of an Automatic Weather Observing System (AWOS) for education & research purposes at CMTT (2014).
5. Establishment of a hydrographic survey lab for education & research purposes at the CMTT (2013).
6. Establishment of a Physical Lab used for undergraduate students at the CMTT (2012).

PERSONAL DATA

Date of Birth : 21/11/1976
Place of Birth : Alexandria, Egypt
Nationality : Egyptian
Marital Status : Married, father of daughter & son.

REFERENCES FURNISHED UPON REQUEST