

Ali Aydoğdu

SCIENTIST

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30.09.1985 Kdz. Ereğli/ Türkiye

Research Experience

Scientist

Bologna - Italy

CENTRO EURO MEDITERRANEO SUI CAMBIAMENTI CLIMATICI (CMCC)

Jan 2025 - present

- EU Copernicus Marine Service **MED-MFC** expert team member
- Schmidt Sciences **SASIP (website)** CMCC responsible and data assimilation expert on sea-ice
- PNRR Spoke4 participant
- HEU FOCCUS participant

Junior Scientist

Bologna - Italy

CENTRO EURO MEDITERRANEO SUI CAMBIAMENTI CLIMATICI (CMCC)

Sep. 2019 – Jan 2025

- EU Copernicus Marine Service **MED-MFC** and **BLK-MFC** expert team member
- H2020 EuroSea (website) WP4 T4.2 leader
- Schmidt Sciences **SASIP (website)** CMCC responsible and data assimilation expert on sea-ice
- PNRR Spoke4 participant
- HEU FOCCUS participant

Visiting Researcher

Boulder - USA

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH (NCAR)

Aug. 2019 – Sep. 2019

- NCAR CISL Visiting Program. FESOM/DART interface implementation

Postdoctoral Researcher

Bergen - Norway

NANSEN ENVIRONMENTAL AND REMOTE SENSING CENTRE (NERSC)

Jun. 2017 – Jun. 2019

- Norwegian Research Council **REDDA**: Ensemble data assimilation using adaptive mesh models / sea-ice data assimilation

Postdoctoral Researcher

Bologna - Italy

CENTRO EURO MEDITERRANEO SUI CAMBIAMENTI CLIMATICI (CMCC)

Sep. 2016 – Jun. 2017

- Implementing Global Ocean Forecasting System on Marconi HPC at CINECA

Research Assistant

Bologna - Italy

CENTRO EURO MEDITERRANEO SUI CAMBIAMENTI CLIMATICI (CMCC)

Mar. 2013 – Sep. 2013

- EU JERICO Project: Observing system simulation experiments in the Adriatic Sea

Research Assistant

Mersin - Turkey

INSTITUTE OF MARINE SCIENCES - METU

Sep. 2009 – Jul. 2012

- EU MyOcean I-II and Sesame Projects: Climate projections of the physics and biogeochemistry in the Northern Levantine Sea

Education

Università Ca' Foscari / CMCC

Venice - Italy

PHD. IN SCIENCE AND MANAGEMENT OF CLIMATE CHANGE

Sep. 2013 - Feb. 2017

- Thesis Title: *Advanced Modeling and Data Assimilation Methods for the Design of Sustained Marine Monitoring Networks*
- Supervisor: Nadia Pinardi

Middle East Technical University

Mersin - Türkiye

M.S. IN PHYSICAL OCEANOGRAPHY

Sep. 2009 - Jul. 2012

- Thesis Title: *Coupled Modelling Attempt of Hydrodynamics and Ecosystem of the Northern Levantine Basin*
- Supervisor: Emin Özsoy

Middle East Technical University

Ankara - Türkiye

B.S. IN MATHEMATICS

Sep. 2003 - Jun. 2009

Teaching

Future earth, climate change and societal challenges

UNIVERSITY OF BOLOGNA - AFFILIATED LECTURER

- Data assimilation in geosciences - Course coordinator

Bologna - Italy

2020 - 2024

Mathematics of Climate Science

CIMPA SUMMER SCHOOL (ONLINE DUE TO PANDEMIC)

- Data Assimilation coding and experiments (report and recording)

Kigali - Rwanda

Jul. 5-13, 2021

Participation to

- Jan. 2024 - **co-chair**, OceanGliders - Data Assimilation Task-Team
Ongoing
- Jan. 2020 - **member**, OceanPredict - Data Assimilation Task-Team
ongoing
- Jan. 2020 - **member**, Mercator Ocean International - Marine Data Assimilation Expert Team
Sep. 2023
- 2017 - **member**, European Geophysical Union
ongoing

Scientific collaborations with

- Nansen Environmental and Remote Sensing Centre / Norway
- National Center for Atmospheric Research / USA
- University of Bologna / Italy

Training

Deep Learning Workshop Participant

ICSC - SPOKE4 EARTH AND CLIMATE

- Practical learning with PyTorch

Online

Sep. 11 / Sep. 15, 2023

Summer School 2023 Participant

CAMBRIDGE - INSTITUTE OF COMPUTING FOR CLIMATE SCIENCE

- Training on high-performance computing on GPUs and machine learning with PyTorch

Online

Jul. 10 / Jul. 14, 2023

Summer School 2022 Participant

CAMBRIDGE - INSTITUTE OF COMPUTING FOR CLIMATE SCIENCE

- Training on high-performance computing and machine learning

Online

Sep. 19 / Sep. 23, 2022

PhD Fellow - Visiting

NCAR - CGD/CISL

- Implementation of ensemble data assimilation scheme for the Turkish Straits System unstructured mesh ocean model

Boulder, Colorado / US

Apr. 1 / Jun. 30, 2016

PhD Fellow - Visiting

CMCC - OCEANLAB

- Ensemble generation and data assimilation for the Turkish Straits System unstructured mesh ocean model

Lecce / Italy

Oct. 15 2015 / Mar. 15, 2016

School on Ocean Climate Modelling

ICTP

- Physical and Biogeochemical Dynamics of Semi-Enclosed Seas

Ankara, Turkey

Sep. 28 / Oct. 1, 2015

Coastal Modeling Summer School

UNIVERSITY OF TOULON

La Londe, France

Sep. 19-23, 2011

Advanced School on Data Assimilation

CENTRO EURO MEDITERRANEO SUI CAMBIAMENTI CLIMATICI (CMCC) AND GRUPPO NAZIONALE DI OCEANOGRAFIA OPERATIVA (GNOO)

Bologna - Italy

Jun. 7-11, 2010

Reviewing for

Journals

- Journal of Climate Dynamics, Ocean Modelling, Ocean Science, JGR-Oceans, Journal of Computational Physics, Nonlinear Processes in Geophysics

Projects

- IS CRA, Qatar University

Skills

Languages	Turkish, English, Italian	
Research Tools	Finite Element Ocean Model (FESOM), Regional Ocean Modeling System (ROMS), neXt Generation Sea Ice Model (neXtSIM), PyTorch	Nucleus for European Modelling of the Ocean (NEMO), Data Assimilation Research Testbed (DART), OceanVar Variational Data Assimilation Tool
Programming	Fortran (advanced), Python (advanced), C/C++ (intermediate), Julia (basics)	
Scripting	Bash, Csh, Lua	
Post-processing	Scientific python libraries, Ferret, Generic Mapping Tools, Matlab	
HPC	OpenMP, MPI	
Documentation	L ^A T _E X, Doxygen	

Field Research

RESEARCH CRUISE

- 2009 - Seven days along Turkish coasts of the Aegean Sea and Mediterranean with R/V Bilim2
- 2010 - Seven days in the Turkish Straits System with R/V Bilim2
- 2010 - Three days in the Gulf of Mersin with R/V Bilim2

Articles peer-reviewed on journal

2025

- **Aydogdu, A.**, Escudier R, Hernandez-Lasheras J, Amadio C, Pistoia J, Zarokanellos ND, Cossarini G, Remy E and Mourre B (2025) Glider observations in the Western Mediterranean Sea: their assimilation and impact assessment using four analysis and forecasting systems. Front. Mar. Sci. 12:1456463. doi: 10.3389/fmars.2025.1456463

2024

- Teruzzi, A., **Aydogdu, A.** et al.: Anomalous 2022 deep-water formation and intense phytoplankton bloom in the Cretan area, in: 8th edition of the Copernicus Ocean State Report (OSR8), edited by: von Schuckmann, K., Moreira, L., Grégoire, M., Marcos, M., Staneva, J., Brasseur, P., Garric, G., Lionello, P., Karstensen, J., and Neukermans, G., Copernicus Publications, State Planet, 4-osr8, 15, <https://doi.org/10.5194/sp-4-osr8-15-2024>, 2024.
- von Schuckmann, K., Moreira, L., Cancet, M., Gues, F., Autret, E., **Aydogdu, A.** et al.: The state of the ocean in the northeastern Atlantic and adjacent seas, in: 8th edition of the Copernicus Ocean State Report (OSR8), edited by: von Schuckmann, K., Moreira, L., Grégoire, M., Marcos, M., Staneva, J., Brasseur, P., Garric, G., Lionello, P., Karstensen, J., and Neukermans, G., Copernicus Publications, State Planet, 4-osr8, 2, <https://doi.org/10.5194/sp-4-osr8-2-2024>, 2024.
- Yang, C., Bourdalle-Badie, R., Drevillon, M., Amaya, D., Aouf, L., **Aydogdu, A.**, et. al, (2024). Gathering users and developers to shape together the next-generation ocean reanalyses: Ocean reanalyses workshop of the European Copernicus Marine Service. Bulletin of the American Meteorological Society. doi: 10.1175/BAMS-D-24-0034.1

- Coppini, G., Clementi, E., Cossarini, G., Salon, S., Korres, G., Ravdas, M., Lecci, R., Pistoia, J., Goglio, A. C., Drudi, M., Grandi, A., **Aydogdu, A.**, et al.: The Mediterranean Forecasting System – Part 1: Evolution and performance, *Ocean Sci.*, 19, 1483–1516, doi: 10.5194/os-19-1483-2023, 2023.
- Aydogdu, A.**, Miraglio, P., Escudier, R., Clementi, E., and Masina, S.: *The dynamical role of upper layer salinity in the Mediterranean Sea*, in: 7th edition of the Copernicus Ocean State Report (OSR7), edited by: von Schuckmann, K., Moreira, L., Le Traon, P.-Y., Grégoire, M., Marcos, M., Staneva, J., Brasseur, P., Garric, G., Lionello, P., Karstensen, J., and Neukermans, G., Copernicus Publications, State Planet, 1-osr7, 6, <https://doi.org/10.5194/sp-1-osr7-6-2023>, 2023.
- Cipollone, A., Banerjee, D. S., Iovino, D., **Aydogdu, A.**, and Masina, S.: *Bivariate sea-ice assimilation for global-ocean analysis-reanalysis*, *Ocean Sci.*, 19, 1375–1392, <https://doi.org/10.5194/os-19-1375-2023>, 2023.
- Cheng, S., Chen, Y., **Aydogdu, A.**, Bertino, L., Carrassi, A., Rampal, P., and Jones, C. K. R. T.: *Arctic sea ice data assimilation combining an ensemble Kalman filter with a novel Lagrangian sea ice model for the winter 2019–2020*, *The Cryosphere*, 17, 1735–1754, doi: 10.5194/tc-17-1735-2023, 2023.

2022

- Ilicak, M., S. Causio, S. Ciliberti, G. Coppini, L. Lima, **A. Aydogdu**, D. Azevedo, R. Lecci, D. U. Cetin, S. Masina, E. Peneva, M. Gunduz, N. Pinardi, 2022. *The Black Sea overturning circulation and its indicator of change*. Copernicus Ocean State Report, issue 6, Journal of Operational Oceanography, 15:sup1, 1-220. doi: doi.org/10.1080/1755876X.2022.2095169
- Masina, S., N. Pinardi, A. Cipollone, D. S. Banerjee, V. Lyubartsev, K. von Schuckmann, L. Jackson, R. Escudier, E. Clementi, **A. Aydogdu**, D. Iovino, 2022. *The Atlantic Meridional Overturning Circulation forcing the mean sea level in the Mediterranean Sea through the Gibraltar transport*. Copernicus Ocean State Report, issue 6, Journal of Operational Oceanography, 15:sup1, 1-220. doi: doi.org/10.1080/1755876X.2022.2095169

2021

- Escudier, R., Clementi, E., Cipollone, A., Pistoia, J., Drudi, M., Grandi, A., Lyubartsev, V., Lecci, R., **Aydogdu, A.**, Delrosso, D., Omar, M., Masina, S., Coppini, G. and Pinardi, N. (2021) *A High Resolution Reanalysis for the Mediterranean Sea*. *Front. Earth Sci.* 9:702285. doi: 10.3389/feart.2021.702285
- Le Traon, P.Y., Abadie, V., Ali, A., Aouf, L., Artioli, Y., Ascione, I., Autret, E., **Aydogdu, A.** et al., 2021. *The Copernicus Marine Service from 2015 to 2021: six years of achievements* Special Issue Mercator Océan Journal #57. doi : <https://doi.org/10.48670/moi-cafr-n813>
- Ciliberti, S.A., Grégoire, M., Staneva, J., Palazov, A., Coppini, G., Lecci, R., Peneva, E., Matreata, M., Marinova, V., Masina, S., Pinardi, N., Jansen, E., Lima, L., **Aydogdu, A.**, Creti, S., Stefanizzi, L., Azevedo, D., Causio, S., Vandenbulcke, L., Capet, A., Meulders, C., Ivanov, E., Behrens, A., Ricker, M., Gayer, G., Palermo, F., Ilicak, M., Gunduz, M., Valcheva, N., Agostini, P. (2021) *Monitoring and Forecasting the Ocean State and Biogeochemical Processes in the Black Sea: Recent Developments in the Copernicus Marine Service*. *J. Mar. Sci. Eng.*, 9, 1146. doi: 10.3390/jmse9101146
- Conti, G., **Aydogdu, A.**, Gualdi, S., Navarra, A., Tribbia, J. (2021) *On the physical nudging equations*. *Clim Dyn.* doi: 10.1007/s00382-021-05972-w
- Von Schuckmann K., Le Traon P-Y., Smith N., Pascual A., Djavidnia S., Gattuso J-P., Grégoire M., et al. (2021), Copernicus Marine Service Ocean State Report, Issue 5. *Journal of Operational Oceanography*, 14:sup1, 1-185, DOI: 10.1080/1755876X.2021.1946240
- Bonaduce A, Cipollone A, Johannessen JA, Staneva J, Raj RP and **Aydogdu A** (2021) *Ocean Mesoscale Variability: A Case Study on the Mediterranean Sea From a Re-Analysis Perspective*. *Front. Earth Sci.* 9:724879. doi: 10.3389/feart.2021.724879
- Lima, L., Ciliberti, S.A., **Aydogdu, A.**, Masina, S., Escudier, R., Cipollone, A., Azevedo, D., Causio, S., Peneva, E., Lecci, R., Clementi, E., Jansen, E., Ilicak, M., Creti, S., Stefanizzi, L., Palermo, F. and Coppini, G. (2021) *Climate Signals in the Black Sea From a Multidecadal Eddy-Resolving Reanalysis*. *Front. Mar. Sci.* 8:710973. doi: 10.3389/fmars.2021.710973
- Sampson, C, Carrassi, A, **Aydogdu, A**, Jones, C.K.R.T. *Ensemble Kalman filter for nonconservative moving mesh solvers with a joint physics and mesh location update*. *Q J R Meteorol Soc.* 2021; 1-23. doi: 10.1002/qj.3980

2020

- Cheng S., **Aydoğdu A.**, Rampal P., Carrassi A., Bertino L.: *Probabilistic Forecasts of Sea Ice Trajectories in the Arctic: Impact of Uncertainties in Surface Wind and Ice Cohesion*, *Oceans*. 2020; 1(4):326-342. doi: 10.3390/oceans1040022

2019

- Aydoğdu, A.**, Carrassi, A., Guider, C.T., Jones, C.K.R.T., Rampal, P.: *Data assimilation using adaptive, non-conservative, moving mesh models*, *Nonlin. Processes Geophys.*, 26, 175-193, doi:10.5194/npg-26-175-2019, 2019.

2018

- Aydoğdu, A.**, Pinardi, N., Özsoy, E., Danabasoglu, G., Gürses, Ö. and Karspeck A.: *Circulation of the Turkish Straits System under interannual atmospheric forcing*, *Ocean Sci.*, 14, 999-1019, doi:10.5194/os-14-999-2018, 2018.
- Aydoğdu, A.**, Hoar, T. J., Vukicevic, T., Anderson, J. L., Pinardi, N., Karspeck, A., Hendricks, J., Collins, N., Macchia, F., and Özsoy, E.: *OSSE for a sustainable marine observing network in the Sea of Marmara*, *Nonlin. Processes Geophys.*, 25, 537-551, doi:10.5194/npg-25-537-2018, 2018.

- **Aydoğdu, A.**, Pinardi, N., Pistoia, J., Martinelli, M., Belardinelli, A. and Sparnocchia, S.: *Assimilation experiments for the Fishery Observing System in the Adriatic Sea*, Journal of Marine Systems, Volume 162, October 2016, Pages 126-136, ISSN 0924-7963, <http://dx.doi.org/10.1016/j.jmarsys.2016.03.002>.
- Sparnocchia, S., Nair, R., Petihakis, G., **Aydoğdu, A.**, Dobricic, S., Farcy, P., Martinelli, M., Petersen, W. and Petit de la Villeon, L.: *An interlinked coastal observatory network for Europe* (2016) Journal of Operational Oceanography, Vol. 9, Iss. sup1, 2016

Book chapters contributed

2017

- Gürses, Ö., **Aydoğdu, A.**, Pinardi, N., and Özsoy, E. (2017). *A finite element modeling study of the Turkish Straits System*. In Oztürk, B. et al., editor, The Sea of Marmara - Marine Biodiversity, Fisheries, Conservations and Governance, pages 169 – 184. TUDAV Publication.

2014

- Özsoy, E., Sofianos, S., Gertman, I., Mantziafou, A., **Aydoğdu, A.**, Georgiou, S., Tutsak, E., Lascaratos, A., Hecht, A. and Latif, M. A. (2014) *Deep-Water Variability and Interbasin Interactions in the Eastern Mediterranean Sea, in The Mediterranean Sea: Temporal Variability and Spatial Patterns* (eds G. L. E. Borzelli, M. Gačić, P. Lionello and P. Malanotte-Rizzoli), John Wiley & Sons, Inc., Oxford. doi: 10.1002/9781118847572.ch7

Conferences / workshops selected

2024

- **Symposium OP'24** Talk: Glider observations in the Western Mediterranean Sea: their assimilation and impact assessment using four analysis and forecasting systems 18-22 November 2024. Paris / France.
- **International Conference on Reanalysis** Poster: Ocean Reanalysis of the Mediterranean and Black Seas: where we are and where we go 28 Oct. - 1 Nov. 2024. Tokyo / Japan
- **International Underwater Glider Conference** Talk: Glider observations in the Western Mediterranean Sea: their assimilation and impact assessment using four analysis and forecasting systems 10-14 June 2024. Gothenburg / Sweden

2023

- **Ocean Reanalyses Workshop of the Copernicus Marine Service**. Toulouse, France. 10-12 October 2023. Talk on Copernicus Marine Physics (Regional) Reanalysis.
- **5th Data Assimilation Task Team Meeting (of OceanPredict)**. CNR. Rome, Italy. 9-11 May 2023. Talk on Recent data assimilation developments in the Mediterranean Sea Analysis and Forecasting System (MedFS).
- **EGU23-5916** - Orals - OS4.10 Aydogdu, A., Pistoia, J., Miraglio, P., Cipollone, A., Grandi, A., Drudi, M., Clementi, E., Masina, S., and Pinardi, N.: Recent data assimilation developments in the Mediterranean Sea Analysis and Forecasting System (MedFS), EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-5916, <https://doi.org/10.5194/egusphere-egu23-5916>, 2023.

2022

- **EuroSea/OceanPredict workshop** on “Ocean Prediction and Observing System Design Talk: Assimilation of gliders in the Western Mediterranean. Ali Aydogdu, Elisabeth Remy, Baptiste Moure, Romain Escudier, Jaime Hernandez-Lasheras, Jenny Pistoia, Alessandro Grandi. 29 June - 1 July 2022. Exeter / UK

2021

- **Operational Satellite Oceanography Symposium**. Poster presentation on The role of satellite observations in the BS-MFC and MED-MFC marine forecasting and reanalysis systems. Ali Aydogdu et al., 25-27 May 2021. Virtual Event.

2020

- **4th Data Assimilation Task Team Meeting (of OceanPredict)**. CERFACS. Toulouse, France. 20-22 January 2020.

2019

- **Scoping Workshop on Future Activities to Assess Impact of Various Observing Systems on Earth System Prediction**. World Meteorological Organization. Geneva, Switzerland, 9-11 December 2019
- **Lunch-time seminar at NCAR**. *Data assimilation using adaptive, moving mesh models*. August 21, 2019. Boulder, USA.

- **Data Assimilation Meetings** at DARC. June 6. Reading, UK. Invited talk: *Ensemble Data Assimilation on a Non-Conservative Adaptive Moving Mesh*.
- **Prediction and Data Assimilation for Non-local Diffusions Workshop**. June 4-5. Edinburgh, UK. Invited Talk: *Ensemble Data Assimilation on a Non-Conservative Adaptive Moving Mesh*.
- **EnKF workshop**. May 28-30. Bergen, Norway. Talk: *Ensemble Data Assimilation on a Non-Conservative Adaptive Moving Mesh*
- **EGU General Assembly**. April 8-13. Vienna, Austria.
- **Arctic Frontiers** 2018. January 21-25. Tromsø, Norway. Talk: *Towards ensemble forecasting and data assimilation in the Arctic using a Lagrangian sea-ice model*.

- **EGU General Assembly**. April 23-28. Vienna, Austria. Talk: *Numerical simulations of the Turkish Straits System for the 2008-2013 period*.
- **8th EuroGOOS International Conference: Operational Oceanography serving sustainable marine development**. October 3-5. Bergen, Norway.
- **Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisan**. October 17-20. Bologna, Italy.
- **8th International Workshop on Sea Ice Modelling, Data Assimilation and Verification**. November 1-3. Bergen, Norway.

- 2016 - 21st **CESM workshop**. June 20-23. Breckenridge, Colorado, USA.
- 2015 - **The 47th Liege Colloquium** on Marine Environmental Monitoring, Modelling and Prediction. May 4-8. Liege, Belgium. Talk on *Assimilation Experiments for the Fishery Observing System in the Adriatic Sea* (invited young scientist)
- 2014 - 7th **EuroGOOS conference**. 28-30 October. Lisbon, Portugal.
- 2013 - **COS-TT GODAE Oceanview Workshop**. February 4-7. Lecce, Italy. Organized by CMCC-Italy. Talk on *Recent Performance of the Northern Levantine Circulation Model (NLEV), Sea Level Calibration and Applications*