Salvatore Causio

Date of birth: 20/03/1984 | **Nationality:** Italian | **Gender:** Male | **Phone number:** (+39) 0832671054 (Work) |

Email address: salvatore.causio@cmcc.it | **Address:** Via Marco Biagi,5, 73100, Lecce, Italy (Work)

WORK EXPERIENCE

29/01/2024 – CURRENT Lecce, Italy
JUNIOR SCIENTIST CMCC-GOCO DIVISION

Main activities focus on the study and investigation of coastal dynamic processes, with particular emphasis on wave-current interactions and extreme events.
- **Principal Investigator** on wave modeling in the GOCO division.
- **Scientific Responsibility** in several European and Italian projects: *Space It Up!*, RENOVATE, PHAROS, EOatSEE, and Fiumicino.
- **Principal Investigator** for wave and hydrodynamic modeling in the Venice Lagoon as part of the RESTCOAST project.
- **MonGOOS** numerical modelling group member
- Research on the study, development, and implementation of **Nature-Based Solutions** in numerical modeling.
- **WAVEWATCH III Developer** with expertise in advanced unstructured meshing tool development.
- Collaboration with the **Norwegian Meteorological Institute** on the development of the global application of WAVEWATCH III within the **Community Earth System Model 2 (CESM2)**.
- **Development Lead** for the online coupling of **WAVEWATCH III-SHYFEM**.
- Expertise in numerical modeling using **WAVEWATCH III**, **NEMO**, and **SHYFEM**.

06/11/2020 – CURRENT Lecce
POST- DOC CMCC- OPA DIVISION

Wave Modeling:
- Main responsibility for wave modeling at regional and coastal scales within the OPA division.
- Numerical modeling expertise with **WAVEWATCH III**, **NEMO**, and **SHYFEM** at regional and coastal scales.
- Statistics, validation, and climate evolution analysis of waves and hydrodynamics at regional and coastal scales.

Research and Development:
- Study, development, and implementation of **Nature-Based Solutions** in numerical modeling.
- **WAVEWATCH III Developer**, with advanced unstructured meshing tool development.

Project Leadership and Involvement:
- **Principal Investigator** for wave and hydrodynamic modeling in the Venice Lagoon under the RESTCOAST project.
- Wave expert member for the **Copernicus Marine Service**.
- Member of the **Product-Quality Working Group** and the **Coastal Interface and Rivers Working Group** for the Black Sea MFC Consortium.

Collaborations and Technical Development:
- Collaboration with the **Norwegian Meteorological Institute** for the global application of **WAVEWATCH III** in the **Community Earth System Model 2 (CESM2)**.
- Development lead for the online coupling of:
- **WAVEWATCH III-SHYFEM**.
- **WAVEWATCH III-NEMO** for the Black Sea NRT-PHY Copernicus Marine Service product.

Copernicus Marine Service Contributions:
- Member of the development team for the **Black Sea NRT-PHY** product.
- Responsible for validation and quality control of the **Black Sea NRT-PHY Copernicus Marine Service** product

02/02/2016 – 05/11/2017
RESEARCHER ASSOCIATE CMCC - OPA DIVISION

Technical Support to Operational Oceanography:
- Data analysis and numerical modeling support, with a focus on **SHYFEM**.
- Development of tools for analyzing structured and unstructured model outputs.

Web Management:
- Maintenance and updating of the **Marine Environment** site (www.marinenvironment.com).

Research and Field Activities:
- **Marine Rapid Environmental Assessment**: Conducting research, data analysis, and field activities.

Advanced Grid and Tool Development:
- Generation of advanced unstructured grids and development of associated tools.

01/02/2016 – CURRENT Lecce
INTERNATIONAL AND NATIONAL PROJECTS CMCC

Active Projects
- **Aliena** (*Interreg VI-A Italy-Croatia*) – 2024-2026
- **PHAROS** (*Horizon Europe*) – 2024-2030
- **FOCCUS** (*Horizon Europe*) – 2024-2026
- **EC-JRC Technical Tender** – 2024
- **Space It Up!** (*PNRR*) – 2024-2026
- **EDITO MODEL LAB** (*Horizon*) – 2023-2025
- **RESTCOAST** (*Horizon 2020*) – 2021-2025
- **IRIDE ph2**(*Commercial*) – 2024-2025
- **PNRR CNB SPOKE HPC** (*PNRR*) – 2022-2025
- **Renovate** (*Commercial*) – 2022-2032
- **Fiumicino 1** (*Commercial*) – 2020-2025

Completed Projects
- **EO-AT-SEE** (*Commercial*) – 2022-2024
- **IRIDE** (*Commercial*) – 2023-2024
- **Eurosea** (*Horizon 2020*) – 2019-2023
- **Fiumicino 0** (*Commercial*) – 2020-2022
- **FishRise** (*PON 2014-2020*) – 2021-2023
- **Stream** (*Interreg*) – 2020-2023
- **EMOD-PACE** (*Commercial*) – 2020-2022
- **OPERANDUM** (*Horizon 2020*) – 2018-2022
- **COPERNICUS BS MFC Phase 2** (*Commercial*) – 2018-2021
- **Innodune** (*PON FESR 2014-2020*) – 2018-2020
- **Marine EO** (*Commercial*) – 2018-2019
- **EcoSmart-Breakwaters** (*Regional Cluster*) – 2016-2020
- **AMARE** (*Interreg*) – 2016-2019
- **COPERNICUS BS MFC** (*Commercial*) – 2016-2018
- **START** (*Regional Cluster*) – 2015-2017

TRAINING CMCC

Lecture: *Waves, Wave Modelling, and Downscaling* at EGEOS, Rome (13-14 September 2022).
PhD Co-Tutoring:
- Shirinov S., University of Bologna (Italy), Department of Physics and Astronomy, Oceanography and Physics of the Atmosphere.

Training and Support for PhD Students:
- Park, K., Georgia Institute of Technology (USA).
- Galeotti, C., University of Bologna (Italy).
- Rizzi, E., University of Bologna (Italy).
- Federica Benassi, University of Bologna (Italy).

EDUCATION AND TRAINING

17/10/2023 online
PUBLIC SPEAKING AND DICTATION COURSE Academia domani s.r.l

25 hours

Website https://accademiadomani.it/ | **Final grade** final grade 93/100

11/09/2023 – 15/09/2023 online
DEEP LEARNING WORKSHOP FBK - Fondazione Bruno Kessler

06/11/2017 – 05/11/2020
PHD- BIOLOGICAL AND ENVIRONMENTAL SCIENCES AND TECHNOLOGY University of Salento

Wave-currents interaction in the BlackSea: new modelling approach for next generation of operational forecasting systems and climate studies.
My PhD focused on the Black Sea hydrodynamical and wave climate simulation from 1988 to 2018. The work aimed to study the wave- current interaction in this basin, comparing uncoupled runs (for hydrodynamics and waves) with 2-ways coupled runs.
Tutor: Prof. Piero Lionello
Co-tutor: Dr. Stefania Angela Ciliberti

Field of study Oceanography

PROFESSIONAL QUALIFICATION - BIOLOGIST University of Salento

12/2014
MASTER DEGREE IN COASTAL AND MARINE BIOLOGY AND ECOLOGY - INTERNATIONAL COURSE University of Salento

This MSc course is in English (lectures, exams, thesis dissertation).
Lectures:
climatology of marginal seas and coastal zones, marine biology and ecology, organic chemistry of coastal and marine ecosystems, life cycles and development, biology and ecology of transitional waters, biological indicator and biomonitoring, systematic botany and quantitative plant ecology, botany, community ecology, environmental microbiology, environmental physiology, ethical economic and normative aspects

Final grade 110/110 cum laude

07/2012
BACHELOR DEGREE IN BIOLOGICAL SCIENCES University of Salento

Curriculum ecological-biological
Bachelor general topics:
Mathematics, chemistry, physics, biochemistry, physiology, informatics, english, zoology, ecology, botany, genetics, anatomy

Final grade 110/110 cum laude

LANGUAGE SKILLS

Mother tongue(s):   **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	C1	B2	B2	B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PUBLICATIONS

Scientific Papers

1.
Causio, S., Federico, I., Jansen, E., Mentaschi, L., Lionello, P. (2023). The Black Sea near-past wave climate and its variability: a hindcast study. *Frontiers in Marine Science* 11 (2024): 1406855.
2.
Maglietta, R., Caccioppoli, R., Piazzolla, D., Saccotelli, L., Cherubini, C., Scagnoli, E., ... & Coppini, G. (2024). Habitat suitability modeling of loggerhead sea turtles in the Central-Eastern Mediterranean Sea: a machine learning approach using satellite tracking data. *Frontiers in Marine Science*, *11*, 1493598.

3.

Bonamano, S., Federico, I., Causio, S., Piermattei, V., Piazzolla, D., Scanu, S., ... & Marcelli, M. (2024). River–coastal–ocean continuum modeling along the Lazio coast (Tyrrhenian Sea, Italy): Assessment of near river dynamics in the Tiber delta. *Estuarine, Coastal and Shelf Science*, *297*, 108618.

4.

Almeida, L., P., Ribeiro, P., Cecilio, C., Bonanad, C., Dufau, C., Fauny, O., Eleveld, M., Mentaschi, L., Federico, I., Coppini, G., Causio, S., Capo, S., Voirand, T., Koudogbo, F., Li Chen, T., Moutinho, J., Ponce de León, S., Restano, M., Benveniste, J., Almar, R., Cazenave, A. (2023). Extreme Sea Level Events and Associated Hazards: A Review of the Main Scientific Challenges and Requirements for Earth Observation Systems. Under review at *Water*

5.

Maglietta, R., Saccotelli, L., Fanizza, C., Telesca, V., Dimauro, G., Causio, S., ... & Carlucci, R. (2023). Environmental variables and machine learning models to predict cetacean abundance in the Central-eastern Mediterranean Sea. *Scientific Reports*, *13*(1), 2600.

6.

Maglietta, R., Saccotelli, L., Fanizza, C., Telesca, V., Dimauro, G., Causio, S., ... & Coppini, G. (2022, October). Generalized additive models for Risso's dolphin group size estimation in the Gulf of Taranto (Northern Ionian Sea, Central-eastern Mediterranean Sea). In *2022 IEEE International Workshop on Metrology for the Sea; Learning to Measure Sea Health Parameters (MetroSea)* (pp. 231-235). IEEE.

7.

Ilicak, M., Causio, S., Ciliberti, S., Coppini, G., Lima, L., Aydogdu, A., Azevedo, D., Lecci, R., Cetin, D. U., Masina, S., Peneva, E., Gunduz, M., Pinardi. N. (2022). The Black Sea overturning circulation and its indicator of change. *Copernicus Ocean State Report, issue 6: Section 2.9., Journal of Operational Oceanography* DOI: 10.1080/1755876x.2022.2095169

8.

Gunduz, M., Causio, S., Bonino, G., Vandenbulcke, L., Gregorie, M., Lima, L., Ciliberti, S., Ilıcak, M., Aydogdu, A., Masina, S., Coppini, G., Pinardi, N. (2022). Coastal upwelling along the Turkish coast of the Black Sea: Its role in the distribution of the hydrographic properties. *Copernicus Ocean State Report, issue 6: Section 4.8. Journal of Operational Oceanography* DOI: 10.1080/1755876x.2022.2095169

9.

Pillai, U. P. A., Pinardi, N., Alessandri, J., Federico, I., Causio, S., Unguendoli, S., ... & Staneva, J. (2022). A Digital Twin modelling framework for the assessment of seagrass Nature Based Solutions against storm surges. *Science of the Total Environment*, *847*, 157603.

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10.

Pillai, U. P. A., Pinardi, N., Federico, I., Causio, S., Trotta, F., Unguendoli, S., & Valentini, A. (2022). Wind-wave characteristics and extremes along the Emilia-Romagna coast. *Natural Hazards and Earth System Sciences*, *22*(10), 3413-3433.

11.

Trotta, F., Federico, I., Pinardi, N., Coppini, G., Causio, S., Jansen, E., ... & Masina, S. (2021). A relocatable ocean modeling platform for downscaling to shelf-coastal areas to support disaster risk reduction. *Frontiers in Marine Science*, *8*, 642815.

12.

Accarino, G., Chiarelli, M., Fiore, S., Federico, I., Causio, S., Coppini, G., & Aloisio, G. (2021). A multi-model architecture based on Long Short-Term Memory neural networks for multi-step sea level forecasting. *Future Generation Computer Systems*, *124*, 1-9.

13.

Ciliberti, S. A., Grégoire, M., Staneva, J., Palazov, A., Coppini, G., Lecci, R., ... & Agostini, P. (2021). Monitoring and forecasting the ocean state and biogeochemical processes in the Black Sea: recent developments in the Copernicus marine service. *Journal of Marine Science and Engineering*, *9*(10), 1146.

14.

Ciliberti, S. A., Jansen, E., Coppini, G., Peneva, E., Azevedo, D., Causio, S., ... & Palazov, A. (2022). The Black Sea Physics Analysis and Forecasting System within the Framework of the Copernicus Marine Service. *Journal of Marine Science and Engineering*, *10*(1),48.

15.

Lima, L., Ciliberti, S. A., Aydoğdu, A., Masina, S., Escudier, R., Cipollone, A., ... & Coppini, G. (2021). Climate signals in the Black Sea from a multidecadal eddy-resolving reanalysis. *Frontiers in Marine Science*, *8*, 710973.

16.

Causio, S., Ciliberti, S. A., Clementi, E., Coppini, G., & Lionello, P. (2021). A modelling approach for the assessment of wave-currents interaction in the Black Sea. *Journal of Marine Science and Engineering*, *9*(8), 893.

17.

Federico, I., Pinardi, N., Lyubartsev, V., Maicu, F., Causio, S., Trotta, F., ... & Zaggia, L. (2020). Observational evidence of the basin-wide gyre reversal in the Gulf of Taranto. *Geophysical Research Letters*, *47*(22).

18.

Guidetti, P., Causio, S., & Licchelli, C. (2012). The first record of Enchelycore anatina (Muraenidae: Pisces) in the Ionian Sea (Mediterranean basin). *Marine Biodiversity Records*, *5*, e22.

CONFERENCES AND SEMINARS

Conferences

1.
   River-coastal-ocean continuum modelling and assessment of nearshore dynamics (2023)
   EGU General Assembly Conference Abstract EGU-14414 – Wien

2.
   RENOVATE Project: ecosystem approach for compensation and mitigation actions in the coastal marine environment (2023)
   EGU General Assembly Conference Abstracts EGU23-13554 - Wien

3.
   Monitoring the Black Sea climate: recent advancements for building ocean indicators (2022)
   EGU General Assembly Conference Abstracts EGU22-8315

4.
   Design and implementation of an integrated coastal observing system at regional scale (2022)
   EGU General Assembly Conference Abstracts. EGU-12050 -Wien

5.
   Black Sea Physics Analysis and Forecasting System (2022)
   EGU General Assembly Conference Abstracts EGU22-7369- On-line

6.
   Numerical models to evaluate the potential effects of new port realization on coastal marine ecosystems (2022)
   EGU General Assembly Conference Abstracts . EGU22-11312 - Wien

7.
   Generalized additive models for Risso's dolphin group size estimation in the Gulf of Taranto (Northern Ionian Sea, Central-eastern Mediterranean Sea) (2022)
   IEEE International Workshop on Metrology for the Sea; Learning to Measure Sea Health Parameters (MetroSea) (pp. 231-235)

8.
   Multimodal data fusion and analysis for cetaceans' presence and abundance estimation in the Gulf of Taranto (2021)
   International Workshop on Metrology for the Sea; Learning to Measure Sea Health Parameters (MetroSea), Reggio Calabria, Italy

9.
   Recent updates to the Copernicus Marine Service Black Sea Analysis and Forecasting System. (2021)
   Geophysical Research Abstracts 21- On-line

10.
   Wave-currents interaction in the Black Sea: new modelling approach for next generation of operational forecasting system (2021)
   EGU General Assembly Conference Abstracts EGU21-9982 – On-line

11.
   Wave climate in the Black Sea: description and trend evaluation using new ECMWF-ERA5 reanalysis and wave-current interaction (2021)
   EGU General Assembly Conference Abstracts EGU21-10000 - On-line

12.
   Nature Based Solution simulation design methods-A storm surge seagrass application (2021)
   EGU General Assembly Conference Abstracts, EGU21-10465 – On-line

13.
   Evolution of the Black Sea Physical Analysis and Forecasting System within CMEMS (2021)
   EGU General Assembly Conference Abstracts, EGU21-6598- On-line

14.
   Wave-currents interaction in the Black Sea: new modelling approach for next generation of operational forecasting system (2021)
   EGU General Assembly Conference Abstracts, EGU21-9982 – On-line

15.
   Design and implementation of an integrated coastal observing system at regional scale (2021)
   EGU General Assembly Conference Abstracts, EGU21-12050 – On-line

16.
   CMEMS BLACK SEA MONITORING AND FORECASTING CENTRE: AN OVERVIEW ON SERVICE AND SCIENTIFIC DEVELOPMENTS IN 2016-2021 AND FUTURE PERSPECTIVES (2021)
   9th EuroGOOS International conference.

17.

The new Black Sea Reanalysis System within CMEMS (2021)
EGU General Assembly Conference Abstracts, EGU21-9599 – On-line

18.

Nature Based Solution simulation design methods–A storm surge seagrass application (2021)
EGU General Assembly Conference Abstracts, EGU21-10465 – On-line

19.

Seamless and cross-scale modelling of the ocean: from regional to shelf-coastal and urban scale (2020)
Ocean Sciences Meeting 2020 -On-line

20.

Multiscale and multidisciplinary Marine Rapid Environmental Assessment data collection methods for process studies: the case of the Taranto Gulf (2019)
EGU General Assembly Conference Abstracts, EGU-19188- Wien

21.

Shelf-coastal seamless Mediterranean-Black sea model nested in Atlantic Ocean: towards an operational forecasting system (2018)
EGU General Assembly Conference Abstracts, EGU-14150 - Wien

22.

Downscaling CMEMS products at the coastal and harbor scales of Apulia region (South-Eastern of Italy): modeling, forecasting and decision support system (2018)
EGU General Assembly Conference Abstracts, EGU-19458 - Wien

23.

Multiscale and multidisciplinary Marine Rapid Environmental Assessment data collection methods for process studies: the case of the Taranto Gulf (2017)
EGU General Assembly Conference Abstracts (p. 19188) - Wien

24.

Identification of Serpulidae (Polychaeta) responsible of stalactite cores in Italian submarine caves (2012)
50th EMBS, Helgoland

20/11/2023
Seminars

1.

CMCC Webinar:Nature Based Solutions for coastal protection: the role of seagrass in wave attenuation- Online event

- **DIGITAL SKILLS**

Digital skills

Programming Languages
- Python
- Fortran
- Bash Scripting
- LaTeX
- NCL (NCAR Command Language)

Operating Systems
- macOS
- Linux
- Windows

Unstructured-Mesh Tools
- Jigsaw + custom-developed tools
- GMSH

Georeferencing Tools
- QGIS

Image Manipulation Software
- Photoshop
- GIMP

Vector Graphics Tools
- Inkscape

3D Visualization Software
- Paraview
- Blender

Version Control and Repositories
- Git

Numerical modelling

Advanced Knowledge:
- Wave numerical model: **WAVEWATCH III**

Good Knowledge:
- Hydrodynamic numerical models: **SHYFEM** and **NEMO**
- Wave numerical model: **SWAN**
- Couplers: **OASIS-MCT** and **CIME**

OTHER SKILLS

About me

Personal Skills
- Strong passion for marine sciences.
- Excellent problem-solving skills and ability to tackle complex challenges.
- Extremely reliable and goal-oriented, with a focus on delivering results.
- Highly analytical, with strong powers of observation and investigation.
- Exceptional resilience and perseverance in demanding work environments.
- Dynamic and adaptable, able to thrive in changing situations.
- Naturally inquisitive, with a constant drive to learn and explore.
- Adept at collaborating seamlessly within a team while also capable of taking initiative and working independently when required.

Hobbies and Interests
- Scuba diving and cave diving.
- Boating and fishing.
- Amateur photography, with a particular interest in marine and natural landscapes.

OCEANOGRAPHIC CRUISES

Marine Rapid Environmental Assessment (MREA)

MREA-16:
- **Date**: 27 June 2016 – 09 July 2016
- **Location**: Gulf of Taranto
- **Activities**: Conducted CTD, ADCP, and radiometric measurements.

MREA-17:
- **Date**: 29 September 2017 – 02 October 2017
- **Location**: Ligurian Sea
- **Activities**: Conducted CTD, ADCP, and radiometric measurements.