

PERSONAL INFORMATION

Emanuela Clementi



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Sex F | Nationality Italian

WORK EXPERIENCE

2018/04/01-present

Junior Scientist

CMCC (Centro Euro-Mediterraneo sui Cambiamenti Climatici) – Viale Berti Pichat 6/2, Bologna, Italy

- Research, development and implementation of a 3D wave-current coupled modelling system in the Mediterranean Sea composed by the circulation model NEMO (Nucleus for European Modelling of the Ocean) and the spectral wave model WaveWatchIII
- Responsible for the Mediterranean Sea NRT physical modelling system development and implementation within the CMEMS Med-MFC (Copernicus Marine Environment Monitoring Service, Mediterranean - Monitoring and Forecasting Center) consortium
- Quality assessment of the physical analysis and forecast numerical product for the Mediterranean Sea by comparing numerical results with both in situ and satellite measurements
- Deputy for the CMEMS Med-MFC consortium
- Responsible for the Regional Ocean Modeling group of the ODA (Ocean modelling and Data Assimilation) division at CMCC

2012/09/01-2018/03/31

Researcher

INGV (Istituto Nazionale di Geofisica e Vulcanologia) – Via Donato Creti 12, Bologna, Italy

- Research, development and implementation of a 3D wave-current coupled modelling system in the Mediterranean Sea composed by the circulation model NEMO (Nucleus for European Modelling of the Ocean) and the spectral wave model WaveWatchIII
- Quality assessment of the physical analysis and forecast numerical product for the Mediterranean Sea by comparing numerical results with both in situ and satellite measurements
- Study and implementation of wave-current interaction processes
- From April 2015: Responsible for the CMEMS Med-MFC product quality
- From January 2015: Responsible for the wave and current numerical modeling development for the analysis and forecast product within the operational oceanography group at INGV
- From January 2015: INGV Officer and leader of the NEMO-WAVE Working Group for the NEMO consortium
- From July 2016: Member of the GODAE Intercomparison and Validation Task Team
- From January 2017: Co-supervisor of Ph.D. Thesis in Geophysics: Damiano Delrosso, title: River runoff impact on a high-resolution numerical model of the Mediterranean Sea
- From 2017: INGV representative in EuroGOOS
- From April 2017: EGU Co-convenor for the Copernicus Marine Environment Monitoring Service (CMEMS) session
- Participation in the MyOcean2, MyOcean FollowOn EU projects and CMEMS Med-MFC phase1

2008-2012

Research Fellow

University of Bologna - CIRSA (Interdepartmental Center of Research on Environmental Sciences), Ravenna, Italy

- Research and development of a 3D high resolution coupled physical-biogeochemical numerical modelling system of the marine ecosystem in the Adriatic Sea composed by the Biogeochemical Flux Model (BFM) and a numerical general circulation model Princeton Ocean Model (POM)
- Modeling the interannual variability of the Adriatic Sea ecosystem using high frequency atmospheric forcing
- Development of numerical experiments aimed at improving marine environmental predictions by testing control, hindcast and scenario
- Validation of the numerical results compared to both in situ and satellite measurements
- Participation to the VECTOR and MEECE EU projects

2007-2008 Term Contract

University of Bologna – DISTART Hydraulics, Italy

- Support in the coordination activities of the Italian coastal network (RIC) of ENCORA (European platform for sharing knowledge and experience among coastal and marine communities)
- Research on the topics: sustainable coastal engineering techniques; technical assessment of in situ observations
- Responsible for contact database RIC related to people, institutions and projects on integrated coastal zone management

2004-2007 PhD Fellow

Polytechnic University of Milan, Italy

Thesis: Hydrodynamics in and around rubble mound breakwaters: experimental analysis and numerical modelling

- Physical and numerical modeling of sea-waves in shallow water and study the interaction of sea waves with coastal, permeable and low crested defense structures (submerged or slightly emerged)
- Design, implementation and realization of physical experiments conducted on permeable low-crested structures in a small-scale channel for waves and currents at the Laboratory of Civil Engineering of the University of Florence
- Analysis of the experimental results by identifying a new empirical formulation of overtopping for low crested structures
- Development of numerical experiments with high resolution two-dimensional code 2DV COBRAS (Cornell Breaking Waves and Structures) simulating wave-permeable structure interaction processes
- Calibration and validation of the numerical model through comparison with experimental data produced in the laboratory

2003-2004 Research Fellow

University of Bologna – DISTART Hydraulics, Italy

- Study of hydrodynamics and morphodynamics in and around low crested coastal defence structures and wave propagation in coastal zone
- Research on typical case studies of low-crested coastal defense structures;
- Study of wave propagation from offshore to onshore
- Participation to the EU project DELOS.

EDUCATION AND TRAINING**2004-2007 PhD in Hydraulics and Coastal Engineering**

Polytechnic University of Milan, Italy

Thesis: Hydrodynamics in and around rubble mound breakwaters: experimental analysis and numerical modelling. Tutor Prof. A. Lamberti. Title achieved the 06/06/2007. Score: excellent

2005 Environmental Technician

ECO-Utility Company, Italy

Environmental legislation and technical issues related to: air, water, waste, polluted sites.

- 1995-2002 **Environmental Engineer**
University of Bologna, Italy
Thesis: Analysis of the river flooding seasonal regime toward a regionalization of the flooding risk indexes in Emilia-Romagna and Marche regions. Supervisor: Prof. A. Brath. Title achieved the 17/07/2002. Score: 96/100
- 1990-1995 **Scientific high school degree**
Scientific high school, Riccione, Italy

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2
French	A2	A2	A2	A2	A2

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills Good communication skills gained through my collaboration in International projects

Computer skills

- OS: MS Windows, Unix/Linux
- Programming Languages: Fortran, Matlab
- Numerical codes: COBRAS (Cornell Breaking Waves and Structure) 2DV model, BFM (Biogeochemical Flux Model), POM (Princeton Ocean Model), NEMO (Nucleus for European Modelling of the Ocean), WW3 (WaveWatchIII).

Other skills Participation to the following specialization courses:

- 8-10 October 2012: Introduction to Parallell Programming and Message Passing Paradigm, CINECA, Bologna, Italy.
- 7-14 September 2011: MEECE Summer School: Marine Ecosystem Evolution in a Changing Environment, METU, Ankara, Turkey.
- 8-13 June 2009 – SESAME Summer School: Coupled Ecological Modelling, University of Malta.
- 27 June-08 July 2005: Summer School: Estuarine and coastal processes in relation to coastal zone management, NIOZ (Royal Netherlands Institute of Sea Research), Texel, The Netherlands.
- 7-18 June 2004: Numerical Methods for Hyperbolic Equations, University of Trento, Italy.

Driving licence B

ADDITIONAL INFORMATION

Publications

Clementi E., Pistoia J., Delrosso D., Mattia G., Fratianni C., Storto A., Drudi M., Grandi A., Ciliberti S.A., Lemieux-Dudon B., Fenu E., Simoncelli S., Padeletti D., Di Pietro P., Pinardi N. (2018). A 1/24 degree resolution Mediterranean analysis and forecasting physical system for the Copernicus Marine Service: description and skill assessment. Geophysical Research Abstracts. Vol. 20, EGU2018-7094.

Liubartseva S., Coppini G., Lecci R., **Clementi E.** (2018). Tracking plastics in the Mediterranean: 2D Lagrangian model. Marine Pollution Bulletin 129(1):151–162. DOI: 10.1016/j.marpolbul.2018.02.019

Coppini G., Liubartseva S., Lecci R., Creti S., Verri G., **Clementi E.**, Pinardi N. (2018). Toward 3D Modeling the Plastic Marine Debris in the Mediterranean. Proceedings of the International Conference on Microplastic Pollution in the Mediterranean Sea. Springer, Cham, pp 37-45.

- Clementi E.**, Pistoia J., Delrosso D., Mattia G., Fratianni C., Storto A., Drudi M., Grandi A., Ciliberti S., Lemieux-Dudon B., Fenu E., Simoncelli S., Padeletti D., Di Pietro P., Lecci R., Coppini G., Pinardi N. (2017). "Mediterranean Sea Analysis and Forecast (CMEMS MED-Currents V3.2 2015-2017)". [Data set]. Copernicus Monitoring Environment Marine Service (CMEMS).
Doi:10.25423/CMCC/MEDSEA_ANALYSIS_FORECAST_PHY_006_013
- Clementi E.**, Pistoia J., Fratianni C., Delrosso D., Grandi A., Drudi M., Coppini G., Lecci R., Pinardi N. (2017). Mediterranean Sea Analysis and Forecast (CMEMS MED-Currents 2013-2017). [Data set].
doi: https://doi.org/10.25423/MEDSEA_ANALYSIS_FORECAST_PHYS_006_001.
- Clementi E.**, Oddo P., Drudi M., Pinardi N., Korres G., Grandi A. (2017). Coupling hydrodynamic and wave models: first step and sensitivity experiments in the Mediterranean Sea. *Ocean Dynamics* Volume 67 (10), pp.1293–1312. doi: <https://doi.org/10.1007/s10236-017-1087-7>.
- Clementi E.**, J. Pistoia, D. Delrosso, G. Mattia, C. Fratianni, A. Storto, S. Ciliberti, B. Lemieux, E. Fenu, S. Simoncelli, M. Drudi, A. Grandi, D. Padeletti, P. Di Pietro, N. Pinardi (2017). A 1/24 degree resolution Mediterranean physical analysis and forecast modeling system for the Copernicus Marine Environment Monitoring Service. Extended abstract to the 8th EuroGOOS Conference, Bergen, 5pp.
- Pistoia J., **Clementi E.**, Delrosso D., Mattia G., Fratianni C., Drudi M., Grandi A., Padeletti D., Di Pietro P., Storto A., Pinardi N. (2017). Last improvements in the data assimilation scheme for the Mediterranean Analysis and Forecast system of the Copernicus Marine Service. Extended abstract to the 8th EuroGOOS Conference, Bergen, 5pp.
- Simoncelli S., Fratianni C., **Clementi E.**, Drudi M., Pistoia J., Grandi A., Del Rosso D. (2017). Monitoring and long-term assessment of the Mediterranean Sea physical state. *Geophysical Research Abstracts* Vol. 17, EGU2015-11839-1, 2015. Vol. 19, EGU2017-16445, 2017.
- Clementi E.**, Delrosso D., Pistoia J., Drudi M., Fratianni C., Grandi A., Pinardi N., Oddo P., Tonani M. (2016). Mediterranean Forecasting System: a focus on wave-current coupling. *Geophysical Research Abstracts*, Vol. 18, EGU2016-17275, 2016.
- Schuckmann, K., Traon P.-Y., Alvarez Fanjul E., Axell L., **Clementi E.**, et al. (2016). The Copernicus Marine Environment Monitoring Service Ocean state report. *Proceedings of the Institute of Marine Engineering, Science, and Technology. Journal of operational oceanography* 9(Sup2):235-320. DOI: 10.1080/1755876X.2016.1273446.
- Cossarini G., **Clementi E.**, Salon S., Grandi A., Bolzon G., Solidoro C. (2016). Skill assessment of the coupled physical-biogeochemical operational Mediterranean Forecasting Syst. *Geophysical Research Abstracts*, Vol. 18, EGU2016-18190, 2016.
- Vieira V., Jurus P., **Clementi E.**, Pettersson H., Mateus M. (2016). The FuGas 2.1 framework for atmosphere-ocean coupling in geoscientific models: improving estimates of the solubilities and fluxes of greenhouse gases and aerosols. *Geoscientific Model Development Discussions*. 1-17. 10.5194/gmd-2016-273.
- Zodiatis G., De Dominicis M., Perivoliotis L., Radhakrishnan H., Georgoudis E., Sotillo M., Lardner R.W., Krokos G., Bruciaferri D., **Clementi E.**, Guarnieri A., et al. (2016). The Mediterranean Decision Support System for Marine Safety dedicated to oil slicks predictions. *Deep Sea Research Part II: Topical Studies in Oceanography*. 133. <https://doi.org/10.1016/j.dsr2.2016.07.014>.
- Delrosso D., **Clementi E.**, Grandi A., Tonani M., Oddo P., Girardi F.G., Pinardi N. (2016). Towards the Mediterranean Forecasting System MyOcean V5: numerical experiments results and validation. *Rapporto Tecnico INGV*. ftp://ftp.ingv.it/pro/cen/Delrosso/technical_report_delrosso_formatted.pdf
- Clementi E.**, P. Oddo, G. Korres, N. Pinardi, M. Drudi, M. Tonani, A. Grandi, M. Adani, 2015. Coupled wave-ocean modeling system experiments in the Mediterranean Sea. *Geophysical Research Abstracts* Vol. 17, EGU2015-11839-1, 2015.
- Chust G., I.J. Allen, L. Bopp, C. Schrum, J. Holt, K. Tsiaras, M. Zavatarelli, M. Chifflet, H. Cannaby, I. Dadou, U. Daewel, S.L. Wakelin, E. Machu, D. Pushpadas, M. Butenschon, Y. Artioli, G. Petihakis, C. Smith, V. Garçon, K. Goubanova, B. Le Vu, B.A. Fach, B. Salihoglu, **E. Clementi**, X. Irigoien, 2014. Biomass changes and trophic amplification of plankton in a warmer ocean. *Global Change Biology*, 20 (7). pp: 2124-2139, DOI: <http://dx.doi.org/10.1111/gcb.12562>
- Tonani M., S. Salon, G. Korres, G. Bolzon, **E. Clementi**, G. Cossarini, A. Crise, M. Drudi, C. Fratianni, G. Girardi, A. Guarnieri, S. Marino, P. Oddo, N. Pinardi, S. Simoncelli, C. Solidoro, and A. Teruzzi, 2013. The Mediterranean Monitoring and Forecasting Centre, a component of the MyOcean System. *Geophysical Research Abstracts* Vol. 15, EGU2013-13628, 2013.
- Clementi E.**, Oddo P., Korres G., Drudi M. Pinardi N., 2013 Coupled wave-ocean modelling system in the Mediterranean Sea. Extended abstract to the 13th Int. Workshop on Wave Hindcasting, Banff, Canada, 2013, 8pp.
- Clementi E.**, Zavatarelli M., Oddo P., 2010. Simulating the interannual variability of the Adriatic Sea ecosystem dynamics. Poster in: 39° CIESM Conf. (Venezia, 2010).
- Clementi E.**, Gaeta M.G., Lamberti A., 2009. Filtration through low crested structures in 2D: experimental and numerical investigations. Proceeding in: 5th Int. Conf. on Coastal Structures 2007, (Venezia, 2007), World Scientific, pp 927-938. DOI 10.1142/9789814282024_0082.
- Clementi E.**, 2008. Analisi sperimentale e studio numerico dell'idrodinamica in prossimità di frangiflutti in massi. Article in *Bollettino AIOM* n.37, pp. 27-31.

Projects

- Clementi E.**, Gaeta M.G., Lamberti A., 2008. Analisi numerica 2DV dei processi idrodinamici indotti dalla presenza di barriere permeabili a cresta bassa. Extended abstract al 31° Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Perugia, 9-12 settembre 2008, 8pp.
- Clementi, E.**, 2007. Hydrodynamics in and around rubble mound breakwaters: experimental analysis and numerical modelling. PhD thesis, 231 pp. Politecnico di Milano.
- Martinelli L., Zanuttigh B., **Clementi E.**, 2007. Transformation of waves from deep water to shallow water. Part III: Tools, Section 13.2, pp. 206-217, in "Environmental Design Guidelines for Low Crested Coastal Defence Structures", Burcharth H. F., Hawkins S., Zanuttigh B. & A. Lamberti, ed.s, Elsevier.
- Clementi E.**, Cappiotti L., Martinelli L., 2006. Analisi sperimentale di tracimazione, piling up e filtrazione per scogliere a cresta bassa. Proceeding in: 30th Convegno Idraulica e Costruzioni Idrauliche, (Roma, 2006). Versione elettronica, 16 pp.
- Clementi E.**, Cappiotti L., Martinelli L., 2006. Wave flume experiments and results on piling up and overtopping for low crested structures. Proceeding in: 1st Int. Conf. on the Application of Physical Modelling to Port and Coastal Protection (Porto, 2006), pp. 413-424.
- Cappiotti L., **Clementi E.**, Aminti P.L., Lamberti A., 2006. Piling-up and filtration at low crested breakwaters of different permeability. Proceeding in: 30th Int. Conf. on Coastal Engineering (San Diego, 2006), Vol. 5, pp. 4957-4969.

Participation and collaboration in the following research projects: and services

- CMEMS Med-MFC: Copernicus Marine Environment Monitoring Service, Mediterranean - Monitoring and Forecasting Center. Phase1 and Phase2.
- EU project MyOcean2 (development of upgrade capabilities for existing GMES fast-track services and related operational services)
- EU project MyOcean Follow On
- DGMARE – EMODNET Mediterranean Sea Basin Checkpoint
- ENCORA (European Platform for Coastal Research Coordination Action, EU FP6 Coordination Action)
- EU-FP7 project MEECE: Marine Ecosystem Evolution in a Changing Environment
- EU-FP6 project DELOS: Low Crested Coastal Defence Structures

Bologna, 10/04/2019

Emanuela Clementi