



PERSONAL INFORMATION


Christian Ferrarin



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ORCID ID 0000-0003-1172-1463

Date of birth 09/07/1975 | Nationality Italy

Current Position Researcher at CNR-ISMAR in Venice

RESEARCH INTERESTS

Summary

My research interests concern coastal oceanography through the analysis of long-term timeseries and the development and application of hydrodynamic and wave numerical models. My research is focused on 1) the numerical study of the wave, current and sediment interaction on shallow areas, 2) the study of the dynamics, frequency, magnitude, predictability, and trends of extreme oceanographic events, such as storm tide, storm surges, Medicanes and coastal flooding, 3) the implementation of oceanographic forecasting systems for and 4) the investigation of the tidal dynamics in coastal basins and semi-enclosed seas. I have been involved in numerous national and international projects dealing with extreme high sea levels, sea storms and coastal flooding. I'm actively involved in the development of the SHYFEM open-source community hydrodynamic model.

Bibliometric Indicators

SCOPUS: h-index 26, citations 1656, documents 62
Google Scholar: h-index 28, citations 2200, i10-index 50

WORK EXPERIENCE

From 2009 to today

CNR Researcher

CNR – Institute of Marine Science in Venice

- coastal oceanography and numerical modelling
- oceanographic forecasting systems for marginal seas and coastal areas
- extreme meteo-marine events

From June 2006 to October 2009

Post-doc Researcher

CNR – Institute of Marine Science in Venice

- Collaboration in the project “Submarine groundwater discharge in the Venice Lagoon” in the activity related to modelling of ground water influences on the Venice Lagoon system

From 2003 to 2006

Research fellow

CNR – Institute of Marine Science in Venice

- modelling of sediment dynamics and residence times in the Venice Lagoon
- modelling the dispersion of dredged materials in the Venice Lagoon

EDUCATION AND TRAINING

2003-2006

PhD in Environmental Sciences

Ca' Foscari University of Venice, Venice (Italy)

- PhD aimed at developing a morphodynamic model (coupling hydrodynamics, waves and sediment transport numerical tools) and its application to the Venice (Italy) and Curonian (Lithuania) lagoons.

1995-2001 **Master of Sciences in Environmental Sciences**

Ca' Foscari University of Venice, Venice (Italy)

- Experimental degree thesis aimed at studying the water circulation and the ecological status of the Cabras Lagoon in Sardinia.

1999 **Erasmus Exchange fellowship**

University of Bergen, Norway

- Numerical modelling and Ecology

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1

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

INSTITUTIONAL RESPONSIBILITIES

2019-today

CNR responsible for the SHYFEM hydrodynamic community model (<https://github.com/SHYFEM-model/shyfem>). This activity is focused on the development of an open-source unstructured finite element model to be used for investigating the coastal oceanographic conditions.

NATIONAL AND INTERNATIONAL GRANTS (last 5 years)

- 2021-2025 Participation to the EU Project H2020 DOORS on data harmonization and High-resolution model simulations of the Black Sea.
- 2021-2023 Principal investigator for CNR in the ADBPO project "Accordo MARE" on developing a climatology of waves and extreme sea levels in the Northern Adriatic Sea.
- 2020-2024 Stakeholder of the EU Project H2020 EMERGE on impact of ship emission, coastal pollution and Lagrangian modelling.
- 2020-2023 Principal investigator for CNR in the EU Interreg Italy-Croatia project AdriaClim on Climate change impact on the Adriatic Sea, High-resolution climatic simulations and Adaptation plans to CC.
- 2020-2023 Principal investigator for CNR in the EU Interreg Italy-Croatia project STREAM on flood risk management, Operational flood forecasts and Sea storms.
- 2019-2022 Participation to the National project ISPRA on Storm surge forecasts, Data assimilation and Extreme Sea levels.
- 2019-2022 Participation to the National project Venezia2021 on Lagoon of Venice ecosystem, MOSE barriers and hydrodynamic modelling.
- 2019-2022 Participation to the EU Interreg WATERCARE project on quality of bathing waters, Coastal modelling and Microbiological contamination.
- 2018-2021 Participation to the EU Interreg PORTODIMARE project Geoportal for data, information and decision support tools and Maritime Spatial Planning in the Adriatic-Ionian Region
- 2018-2020 Principal investigator for CNR in the EU Interreg Adrion project I-STORMS on Sea storm management; ocean forecasts; coastal flooding; multi-model ensemble.
- 2016-2020 Principal investigator in the National project "Stato ambientale della Laguna di Venezia ed elementi per la pianificazione sostenibile delle attività portuali" on Shipping impact and sediment resuspension and modeling ship-induced waves.
- 2016-2019 Principal investigator in the National Project "SOS-Piattaforme e Impatti Off-Shore" founded by the Italian Ministry of the Environment – MATTM, with the aim of developing innovative tools for the management of the risk derived from the accidental release of hydrocarbons at sea.
- 2015-2016 Principal investigator for CNR in the EEA Grants – KuMaDuBi on Nutrients and sediment balance in the Curonian Lagoon, Biogeochemical, hydrodynamic and sediment transport modelling.

TEACHING ACTIVITY

2006-2007

Contract lecturer for the annual course “Istituzioni di Matematiche con Esercitazioni - modulo 1” at the Ca' Foscari University in Venice.

FURTHER INFORMATION

Prototypes: mathematical tools and web-sites

- **SHYFEM developers team member.** An open-source finite element ocean model freely available at <https://github.com/SHYFEM-model/shyfem>
- **I-STORMS information system developer.** The I-STORMS Web System is a combination of a common data system for sharing ocean measurements and forecasts, a multi-model forecasting system, a geoportal and interactive geo-visualization tools to make results available to the general public (Open I-STORMS), <https://iws.seastorms.eu/>.

Memberships

Evaluation of research results

- EGU since 2017
- Reviewer for Journal of Operational Oceanography, Journal of Geophysical Research, Ocean Modelling, Water, Science of the Total Environment, Ocean Dynamics, Marine Pollution Bulletin, Estuarine Continental Shelf Research, Scientific Reports.

Personal data

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Date: Venice, 15 June 2022

Signature: Christian Ferrarin

List of the top publications in the main research field (in the last ten years)

1. [Ferrarin, C.](#), Lionello, P., Orlić, M. et al. (2022), Venice as a paradigm of coastal flooding under multiple compound drivers. *Sci Rep* 12, 5754, doi: 10.1038/s41598-022-09652-5
2. [Ferrarin, C.](#), M. Bajo, A. Benetazzo, L. Cavaleri, J. Chiggiato, S. Davison, S. Davolio, P. Lionello, M. Orlic, and G. Umgiesser (2021), Local and large-scale controls of the exceptional Venice floods of November 2019, *Prog. Oceanogr.*, 197, 102,628, doi: 10.1016/j.pocean.2021.102628
3. [Ferrarin, C.](#), M. Bajo, and G. Umgiesser (2021), Model-driven optimization of coastal sea observatories through data assimilation in a finite element hydrodynamic model (SHYFEM v.7_5_65), *Geosci. Model Dev.*, 14, 645–659, doi: 10.5194/gmd-14-645-2021
4. Penna, P., E. Baldrighi, M. Betti, L. Bolognini, A. Campanelli, S. Capellacci, S. Casabianca, [C. Ferrarin](#), G. Giuliani, F. Grilli, M. Intoccia, E. Manini, F. Moro, A. Penna, F. Ricci, and M. Marini (2021), Water quality integrated system: a strategic approach to improve bathing water management, *J. Environ. Manage.*, 295, 113,099, doi: 10.1016/j.jenvman.2021.113099
5. [Ferrarin, C.](#), P. Penna, A. Penna, V. Spada, F. Ricci, J. Bilic, M. Krzelj, M. Ordulj, M. Sikoronja, I. Duracic, L. Iagnemma, M. Bucan, E. Baldrighi, F. Grilli, F. Moro, S. Casabianca, L. Bolognini, and M. Marini (2021), Modelling the quality of bathing waters in the Adriatic Sea, *Water*, 13(11), 1525, doi: 10.3390/w13111525
6. Lionello, P., Barriopedro, D., [Ferrarin, C.](#), Nicholls, R. J., Orlić, M., Raicich, F., Reale, M., Umgiesser, G., Vousdoukas, M., and Zanchettin, D. (2021), Extreme floods of Venice: characteristics, dynamics, past and future evolution (review article), *Nat. Hazards Earth Syst. Sci.*, 21, 2705–2731 doi: 10.5194/nhess-21-2705-2021.
7. Zanchettin, D., Bruni, S., Raicich, F., Lionello, P., Adloff, F., Androsov, A., Antonioli, F., Artale, V., Carminati, E., [Ferrarin, C.](#), Fofonova, V., Nicholls, R. J., Rubinetti, S., Rubino, A., Sannino, G., Spada, G., Thiéblemont, R., Tsimplis, M., Umgiesser, G., Vignudelli, S., Wöppelmann, G., and Zerbini, S. (2021), Sea-level rise in Venice: historic and future trends (review article), *Nat. Hazards Earth Syst. Sci.*, 21, 2643–2678, doi: 10.5194/nhess-21-2643-2021.
8. Umgiesser, G., Bajo, M., [Ferrarin, C.](#), Cucco, A., Lionello, P., Zanchettin, D., Papa, A., Tosoni, A., Ferla, M., Coraci, E., Morucci, S., Crosato, F., Bonometto, A., Valentini, A., Orlić, M., Haigh, I. D., Nielsen, J. W., Bertin, X., Fortunato, A. B., Pérez Gómez, B., Alvarez Fanjul, E., Paradis, D., Jourdan, D., Pasquet, A., Mourre, B., Tintoré, J., and Nicholls, R. J. (2021), The prediction of floods in Venice: methods, models and uncertainty (review article), *Nat. Hazards Earth Syst. Sci.*, 21, 2679–2704, doi: 10.5194/nhess-21-2679-2021.
9. Cavaleri L., L Bertotti, [C. Ferrarin](#), M Passaro, P Pezzutto, A Pomaro (2021), Synergic use of altimeter and model sea level data in inner and coastal seas, *Remote Sensing of Environment* 261, 112500, doi: 10.1016/j.rse.2021.112500.
10. Bellafiore, D., [C. Ferrarin](#), F. Maicu, G. Manfè, G. Lorenzetti, G. Umgiesser, L. Zaggia, and A. Valle-Levinson (2021), Saltwater intrusion in a Mediterranean delta under a changing climate, *J. Geophys. Res. Oceans*, 126(2), e2020JC016,437, doi: 10.1029/2020JC016437

11. Cavaleri, L., M. Bajo, F. Barbariol, M. Bastianini, A. Benetazzo, L. Bertotti, J. Chiggiato, C. Ferrarin, F. Trincardi, and G. Umgiesser (2020), The 2019 flooding of Venice and its implications for future predictions, *Oceanography*, 33(1), 42–49, doi: 10.5670/oceanog.2020.105
12. Ferrarin, C., A. Valentini, M. Vodopivec, D. Klaric, G. Massaro, M. Bajo, F. De Pascalis, A. Fadini, M. Ghezzi, S. Menegon, L. Bressan, S. Unguendoli, A. Fettich, J. Jerman, M. Licer, L. Fustar, A. Papa, and E. Carraro (2020), Integrated sea storm management strategy: the 29 October 2018 event in the Adriatic Sea, *Nat. Hazards Earth Syst. Sci.*, 20(1), 73–93, doi: 10.5194/nhess-20-73-2020
13. Ferrarin, C., S. Davolio, D. Bellafiore, M. Ghezzi, F. Maicu, O. Drofa, G. Umgiesser, M. Bajo, F. De Pascalis, P. Malguzzi, L. Zaggia, G. Lorenzetti, G. Manfè, and W. Mc Kiver (2019), Cross-scale operational oceanography in the Adriatic Sea, *J. Oper. Oceanogr.* 12(2), 86–103, doi: 10.1080/1755876X.2019.1576275
14. Mežlne, J., C. Ferrarin, D. Vaiciute, R. Idzelyte, P. Zemlys, and G. Umgiesser (2019), Sediment transport mechanisms in a lagoon with high river discharge and sediment loading, *Water*, 11(10), 1970, doi: 10.3390/w11101970
15. Cavaleri, L., M. Bajo, F. Barbariol, M. Bastianini, A. Benetazzo, L. Bertotti, J. Chiggiato, S. Davolio, C. Ferrarin, L. Magnusson, A. Papa, P. Pezzutto, A. Pomaro, and G. Umgiesser (2019), The October 29, 2018 storm in Northern Italy - an exceptional event and its modeling, *Prog. Oceanogr.*, 178, 102,178, doi: 10.1016/j.pocean.2019.102178
16. Bellafiore, D., C. Ferrarin, F. Braga, L. Zaggia, F. Maicu, G. Lorenzetti, G. Manfè, V. Brando, and F. De Pascalis (2019), Coastal mixing in multiple-mouth deltas: a case study in the Po Delta, Italy its modeling, *Estuarine Coastal Shelf Sci.*, 226, 106,254, doi: 10.1016/j.ecss.2019.106254
17. Ribotti, A., F. Antognarelli, A. Cucco, M. F. Falcieri, L. Fazioli, C. Ferrarin, A. Olita, G. Oliva, A. Pes, G. Quattrocchi, A. Satta, S. Simeone, C. Tedesco, G. Umgiesser, and R. Sorgente (2019), An Operational Marine Oil Spill Forecasting Tool for the Management of Emergencies in the Italian Seas, *J. Mar. Sci. Eng.*, 7(1), doi: 10.3390/jmse7010001
18. Tintoré, J., N. Pinardi, E. A. Fanjul, R. Balbin, R. Bozzano, C. Ferrarin, M. Bajo, et al. (2019), Challenges for Sustained Observing and Forecasting Systems in the Mediterranean Sea, *Front. Mar. Sci.*, 6, 568, doi: 10.3389/fmars.2019.00568
19. Ferrarin, C., D. Bellafiore, G. Sannino, M. Bajo, and G. Umgiesser (2018), Tidal dynamics in the inter-connected Mediterranean, Marmara, Black and Azov seas, *Prog. Oceanogr.*, 161, 102–115, doi: 10.1016/j.pocean.2018.02.006
20. Bellafiore, D., W. Mc Kiver, C. Ferrarin, and G. Umgiesser (2018a), The importance of modeling nonhydrostatic processes for dense water reproduction in the southern Adriatic Sea, *Ocean Model.*, 125, 22–28, doi: 10.1016/j.ocemod.2018.03.001
21. Ferrarin, C., F. Madricardo, F. Rizzetto, W. Mc Kiver, D. Bellafiore, G. U. A. Kruss, L. Zaggia, F. Foglini, A. Ceregato, A. Sarretta, and F. Trincardi (2018a), Geomorphology of scour holes at tidal channel confluences, *J. Geophys. Res. Earth Surface*, 123, 1–21, doi: 10.1029/2017JF004489
22. Maicu, F., F. De Pascalis, C. Ferrarin, and G. Umgiesser (2018), Hydrodynamics of the Po River-Delta-Sea system, *J. Geophys. Res. Oceans*, 123, 6349–6372, doi: 10.1029/2017JC013601
23. Stefani, F., N. Casatta, C. Ferrarin, I. Izzotti, F. Maicu, and L. Viganò (2018), Gene expression and genotoxicity in Manila clam (*Ruditapes philippinarum*) modulated by sediment contamination and lagoon dynamics in the Po River delta, *Mar. Environ. Res.*, 142, 257–274, doi: 10.1016/j.marenvres.2018.10.010
24. Bellafiore, D., L. Zaggia, R. Brogna, C. Ferrarin, F. Barbariol, S. Zaghi, G. Lorenzetti, G. Manfè, F. De Pascalis, and A. Benetazzo (2018b), Modeling ship-induced waves in shallow water systems: the Venice experiment, *Ocean Eng.*, 155, 227–239, doi: 10.1016/j.oceaneng.2018.02.039
25. Ferrarin, C., F. Maicu, and G. Umgiesser (2017), The effect of lagoons on Adriatic Sea tidal dynamics, *Ocean Model.*, 119, 57–71, doi: 10.1016/j.ocemod.2017.09.009
26. Quattrocchi, G., A. Cucco, F. Antognarelli, A. Satta, F. Maicu, C. Ferrarin, and G. Umgiesser (2016), Optimal design of a lagrangian observing system for hydrodynamic surveys, *J. Oper. Oceanogr.*, 9(sup1), s77–s88, doi: 10.1080/1755876X.2015.1114805
27. Amos, C. L., G. Umgiesser, M. Ghezzi, H. Kassem, and C. Ferrarin (2017), Sea surface temperature trends in venice lagoon and the adjacent waters, *J. Coastal Res.*, 33(2), 385–395, doi: 10.2112/JCOASTRES-D-16-00017.1
28. Umgiesser, G., P. Zemlys, A. Erturk, A. Razinkova-Baziukas, J. Mežlne, and C. Ferrarin (2016), Seasonal renewal time variability in the Curonian Lagoon caused by atmospheric and hydrographical forcing, *Ocean Sci.*, 12(2), 391–402, doi: 10.5194/os-12-391-2016
29. Brando, V. E., F. Braga, L. Zaggia, C. Giardino, M. Bresciani, D. Bellafiore, C. Ferrarin, F. Maicu, A. Benetazzo, D. Bonaldo, F. M. Falcieri, A. Coluccelli, A. Russo, and S. Carniel (2015), High resolution satellite turbidity and sea surface temperature observations of river plume interactions during a significant flood event, *Ocean Sci.*, 11(6), 909–920, doi: 10.5194/os-11-909-2015
30. Ferrarin, C., A. Tomasin, M. Bajo, A. Petrizzo, and G. Umgiesser (2015), Tidal changes in a heavily modified coastal wetland, *Cont. Shelf Res.*, 101, 22–33, doi: 10.1016/j.csr.2015.04.002
31. Ferrarin, C., M. Bajo, D. Bellafiore, A. Cucco, F. De Pascalis, M. Ghezzi, and G. Umgiesser (2014), Toward homogenization of Mediterranean lagoons and their loss of hydrodiversity, *Geophys. Res. Lett.*, 41(16), 5935–5941, doi: 10.1002/2014GL060843
32. Umgiesser, G., C. Ferrarin, A. Cucco, F. De Pascalis, D. Bellafiore, M. Ghezzi, and M. Bajo (2014), Comparative hydrodynamics of 10 Mediterranean lagoons by means of numerical modeling, *J. Geophys. Res. Oceans*, 119(4), 2212–2226, doi: 10.1002/2013JC009512
33. Molinaroli, E., A. Sarretta, C. Ferrarin, E. Masiero, A. Specchiulli, and S. Guerzoni (2014), Sediment grain size and hydrodynamics in Mediterranean coastal lagoons: integrated classification of abiotic parameters, *J. Earth Syst. Sci.*, 123(4), 1097–1114, doi: 10.1007/s12040-014-0445-9
34. Bajo, M., C. Ferrarin, I. Dinu, A. Stanica, and G. Umgiesser (2014), The circulation near the Romanian coast and the Danube Delta modelled with finite elements, *Cont. Shelf Res.*, 78, 62–74, doi: 10.1016/j.csr.2014.02.006
35. Ferrarin, C., L. Zaggia, E. Paschini, T. Scirocco, G. Lorenzetti, M. Bajo, P. Penna, M. Francavilla, R. D'Adamo, and S. Guerzoni (2014b), Hydrological regime and renewal capacity of the micro-tidal Lesina Lagoon, Italy, *Estuaries Coasts*, 37(1), 79–93, doi: 10.1007/s12237-013-9660-x

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38. Ferrarin, C., A. Bergamasco, G. Umgiesser, and A. Cucco (2013a), Hydrodynamics and spatial zonation of the Capo Peloro coastal system (Sicily) through 3-D numerical modeling, *J. Mar. Syst.*, 117-118, 96–107, doi: 10.1016/j.jmarsys.2013.02.005
39. Ferrarin, C., M. Ghezzi, G. Umgiesser, D. Tagliapietra, E. Camatti, L. Zaggia, and A. Sarretta (2013b), Assessing hydrological effects of human interventions on coastal systems: numerical applications to the Venice Lagoon, *Hydrol. Earth Sys. Sci.*, 17(5), 1733–1748, doi: 10.5194/hess-17-1733-2013
40. Ferrarin, C., A. Roland, M. Bajo, G. Umgiesser, A. Cucco, S. Davolio, A. Buzzi, P. Malguzzi, and O. Drofa (2013), Tide-surge-wave modelling and forecasting in the Mediterranean Sea with focus on the Italian coast, *Ocean Model.*, 61, 38–48, doi: 10.1016/j.ocemod.2012.10.003