



Momme Butenschön

Work

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ABOUT ME

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SCOPUS METRICS

2176 citations, h-index: 26 (as of 10/03/2025)

WORK EXPERIENCE

[31/08/2017 – Current]

Lead Scientist of the Earth System and Marine Biogeochemistry Research Unit

Institute for Earth System Predictions - Centro Euro-Mediterraneo sui Cambiamenti Climatici

City: Bologna

Coordination of CMCC's Earth System Model (CMCC-ESM) development and the marine biogeochemistry modelling activities at CMCC based on the BFM model. Prominent roles in a multitude of European and national projects (e.g. RESUCE, FutureMARES, CRiceS, C-BLUES, , CE2COAST, NECCTON, OceanICU). Author of more than 45 peer reviewed articles on a variety of topics ranging from studies on impacts of anthropogenic and climate change on the marine ecosystem and ecosystem services, natural variability and model uncertainty to physiological process studies. Contributing author of the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate and the most recent FAO report on Impacts of Climate Change on fisheries and aquaculture.

[01/07/2023 – 30/09/2023]

Interim Director of the Ocean Modelling and Data Assimilation Division

Ocean Modeling and Data Assimilation Division - Centro Euro-Mediterraneo sui Cambiamenti Climatici

City: Bologna

[06/01/2020 – 01/07/2023]

Deputy Director

Ocean Modeling and Data Assimilation Division - Centro Euro-Mediterraneo sui Cambiamenti Climatici

City: Bologna

[30/06/2012 – 30/08/2017]

Senior Scientist

Plymouth Marine Laboratory

Senior Scientist position at the Plymouth Marine Laboratory as Marine Ecosystem Modeller. Leading and coordinating the development of the ecosystem model ERSEM developed in-house and in collaboration with teams at the UK met-office, the National Oceanographic Centre (NOC) and the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), as well as the development of coupled physical biogeochemical systems,

in particular the modelling system for the North-West European Shelf within the Copernicus Marine Environmental Monitoring Service (CMEMS).

[03/02/2008 – 29/06/2012]

Scientist

Plymouth Marine Laboratory

Scientist position at the Plymouth Marine Laboratory as Marine Ecosystem Modeller on the development of the ecosystem model ERSEM and its coupling to general circulation models; strong involvement in a multitude of research initiatives.

[25/06/2007 – 30/01/2008]

Post-Doc (Full time employee)

Alma Mater Studiorum Università di Bologna

Development of a coupled marine ecosystem dynamics model including data assimilation based on the Princeton Ocean Model and the Biogeochemical Flux Model.

[2002 – 2007]

Post-Graduate (Full time employee)

Development of a coupled marine ecosystem dynamics model including data assimilation as part of the EU FP5 MFSTEP project.

[2001 – 2003]

Post-Graduate (Full time employee)

Centro di Ricerca Nazionale

Development of an Air-pollution/Atmospheric-Chemistry-Dynamics Model.

[2000 – 2001]

Graduate Student (Full time employee, 8 month)

FOI

Turbulence modelling in compressible flow, air wing simulations, rocket nozzle flow.

[1999 – 2001]

Graduate Student (Part time employee, 60h/month for 1 year)

Technische Universität

Research projects on turbulence modelling and air wing simulations.

[1998 – 1999]

Graduate Student (Full time employee, 4 month)

FFA

Research project on flow simulations of rocket nozzles.

EDUCATION AND TRAINING

[31/10/2003 – 24/07/2007]

PhD Geophysics

Alma Mater Studiorum Università di Bologna

City: Bologna | **Country:** Italy |

[30/09/1994 – 23/02/2002]

MSc Physikalische Ingenieurwissenschaft/Engineering Physics

Technisch Universität Berlin/Kungliga Tekniska Högskolan Stockholm

LANGUAGE SKILLS

Mother tongue(s): German

Other language(s):

Italian

LISTENING C2 READING C2 WRITING C2

SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2

English

LISTENING C2 READING C2 WRITING C2

SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2

Swedish

LISTENING B2 READING B2 WRITING B2

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

French

LISTENING B1 READING B1 WRITING B1

SPOKEN PRODUCTION B1 SPOKEN INTERACTION B1

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

DIGITAL SKILLS

My Digital Skills

Microsoft Office | Zoom | Google Drive | Skype | High level knowledge of Fortran and python acquired through academic training and research work | Good knowledge of julia, MATLAB, C C++

COMMUNICATION AND INTERPERSONAL SKILLS

Excellent communication and interpersonal skills gained through experiences in coordination of research tasks at institutional, national and international level and presentations in scientific and policy information workshops and conferences.

MANAGEMENT AND LEADERSHIP SKILLS

More than 10 years of experiences as line manager of permanent and temporary members of staff

Supervision of PhD and MSc students at the Univeristies of Bologna and Venice

Contract lecturer at the Università Ca'Foscari di Venezia in the PhD program "Science and Management of Climate Change" (2018-2020)

Coordination of international research collaborations involving the management of the development of software packages for operational systems

NETWORKS AND MEMBERSHIPS

CMCC representative in the Ocean Vision Network

BFM System Team Coordinator

Consortium Expert on the Scientific Advisory Board of the NEMO consortium

Nominated Member of the ICES Expert Group on Integrative, Biological-Physical Modelling

PUBLICATIONS

[2024] [OARS Outcome 5: Provide appropriate data and information necessary to the development of societally relevant predictions and projections.](#)

Reference: in: Ocean Acidification Research for Sustainability – A Community Vision for the Ocean Decade., IOC Technical Series. IOC-UNESCO, Paris, pp. 47–56.

Siedlecki, S., Bellerby, R., School, K.L., Pitcher, G., Lovenduski, N., Long, M., **Butenschön, M.**, Sutton, A.

[2024] [Fish distribution's shifts due to climate change in the Northeast Atlantic: Using a hierarchical filtering approach on marine-estuarine opportunist species](#)

Reference: Estuarine, Coastal and Shelf Science 109013

Janc, A., Dambrine, C., Lambert, P., Lassalle, G., Lepage, M., Lobry, J., Pierre, M., Kristiansen, T., **Butenschön, M.**, Cabral, H.N.

- [2024] [Diving into warming oceans: Assessing 3D climatically suitable foraging areas of loggerhead sea turtles under climate change.](#)

Reference: Journal for Nature Conservation 79, 126620.

Chatzimentor, A., Doxa, A., **Butenschön, M.**, Kristiansen, T., Peck, M.A., Katsanevakis, S., Mazaris, A.D.

- [2024] [Statistically downscaled CMIP6 ocean variables for European waters](#)

Reference: Sci Rep 14, 1209.

Kristiansen, T., **Butenschön, M.**, Peck, M.A.

- [2024] [Projected climate oligotrophication of the Adriatic marine ecosystems](#)

Reference: Frontiers in Climate 6.

Mentaschi, L., Lovato, T., **Butenschön, M.**, Alessandri, J., Aragão, L., Verri, G., Guerra, R., Coppini, G., Pinardi, N.

- [2024] [Impacts of climate change on water quality, benthic mussels, and suspended mussel culture in a shallow, eutrophic estuary.](#)

Reference: Heliyon 10, e2521

Maar, M., Larsen, J., **Butenschön, M.**, Kristiansen, T., Thodsen, H., Taylor, D., Schourup-Kristensen, V.

- [2023] [Simulations of ocean deoxygenation in the historical era: insights from forced and coupled models](#)

Reference: Frontiers in Marine Science 10

Takano, Y., Ilyina, T., Tjiputra, J., Eddebbar, Y.A., Berthet, S., Bopp, L., Buitenhuis, E., **Butenschön, M.**, Christian, J.R., Dunne, J.P., Gröger, M., Hayashida, H., Hieronymus, J., Koenigk, T., Krasting, J.P., Long, M.C., Lovato, T., Nakano, H., Palmieri, J., Schwinger, J., Séférian, R., Suntharalingam, P., Tatebe, H., Tsujino, H., Urakawa, S., Watanabe, M., Yool, A.

- [2023] [The representation of alkalinity and the carbonate pump from CMIP5 to CMIP6 ESMs and implications for the ocean carbon cycle](#)

Reference: Biogeosciences

Planchat, A., Kwiatkowski, L., Bopp, L., Torres, O., Christian, J. R., **Butenschön, M.**, Lovato, T., Séférian, R., Chamberlain, M. A., Aumont, O., Watanabe, M., Yamamoto, A., Yool, A., Ilyina, T., Tsujino, H., Krumhardt, K. M., Schwinger, J., Tjiputra, J., Dunne, J. P., and Stock, C.

- [2022] [Alkalinization Scenarios in the Mediterranean Sea for Efficient Removal of Atmospheric CO2 and the Mitigation of Ocean Acidification.](#)

Reference: Frontiers in Climate, 3:614537.

Butenschön, M., Lovato, T., Masina, S., Caserini, S., Grosso, M.

- [2022] **CMIP6 simulations with the CMCC Earth System Model (CMCC-ESM2).**

Reference: Journal of Advances in Modeling Earth Systems.

Lovato, T., Peano, D., **Butenschön, M.**, Materia, S., Iovino, D., Scoccimarro, E., Fogli, P.G., Cherchi, A., Bellucci, A., Gualdi, S., Masina, S., Navarra, A.

- [2021] [Persistent Uncertainties in Ocean Net Primary Production Climate Change Projections at Regional Scales Raise Challenges for Assessing Impacts on Ecosystem Services.](#)
- Reference:** Frontiers in Climate, 3:738224.
- Tagliabue, A., Kwiatkowski, L., Bopp, L., **Butenschön, M.**, Cheung, W., Lengaigne, M., Vialard, J.
- [2021] [Next-generation regional ocean projections for living marine resource management in a changing climate.](#)
- Reference:** ICES Journal of Marine Science.
- Drenkard, E.J., Stock, C., Ross, A.C., Dixon, K.W., Adcroft, A., Alexander, M., Balaji, V., Bograd, S.J., Butenschön, M., Cheng, W., Curchitser, E., di Lorenzo, E., Dussin, R., Haynie, A.C., Harrison, M., Hermann, A., Hollowed, A., Holsman, K., Holt, J., Jacox, M.G., Jang, C.J., Kearney, K.A., Muhling, B.A., Buil, M.P., Saba, V., Sandø, A.B., Tommasi, D., Wang, M.
- [2020] [Controls on near-bed oxygen concentration on the Northwest European Continental Shelf under a potential future climate scenario.](#)
- Reference:** Progress in Oceanography, 102400.
- Wakelin, S.L., Artioli, Y., Holt, J.T., **Butenschön, M.**, Blackford, J.
- [2020] [Modeling the seasonality and controls of nitrous oxide emissions on the northwest European continental shelf.](#)
- Reference:** Journal of Geophysical Research: Biogeosciences 125, e2019JG005613.
- Lessin, G., Polimene, L., Artioli, Y., **Butenschön, M.**, Clark, D.R., Brown, I., Rees, A.P.
- [2020] [Can we project changes in fish abundance and distribution in response to climate?](#)
- Reference:** Global Change Biology 26, 3891–3905.
- Fernandes, J.A., Rutterford, L., Simpson, S.D., **Butenschön, M.**, Frölicher, T.L., Yool, A., Cheung, W.W.L., Grant, A.
- [2019] [Chapter 5: Changing Ocean, Marine Ecosystems, and Dependent Communities.](#)
- Reference:** in: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate
- Bindoff, N.L., Cheung, W.W.L., Kairo, J.G., Aristegui, J., Guinder, V.A., Hallberg, R., Hilmi, N., Jiao, N., Karim, M.S., Levin, L., O'Donoghue, S., Purca Cuicapusa, S.R., Rinkevich, B., Suga, T., Tagliabue, A., Williamson, P., et al.
- Contributing Author.*
- [2018] [Projecting changes in the distribution and productivity of living marine resources: A critical review of the suite of modelling approaches used in the large European project VECTORS.](#)
- Reference:** Estuarine, Coastal and Shelf Science, Vectors of change in the marine environment 201, 40–55.
- Peck, M.A., Arvanitidis, C., **Butenschön, M.**, Canu, D.M., Chatzinikolaou, E., Cucco, A., Domenici, P., Fernandes, J.A., Gasche, L., Huebert, K.B., Hufnagl, M., Jones, M.C., Kempf, A., Keyl, F., Maar, M., Mahévas, S., Marchal, P., Nicolas, D., Pinnegar, J.K., Rivot, E., Rochette, S., Sell, A.F., Sinerchia, M., Solidoro, C., Somerfield, P.J., Teal, L.R., Travers-Trolet, M., van de Wolfshaar, K.E.

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- Reference:** Ecological Modelling 376, 54–67.
- Maar, M., **Butenschön, M.**, Daewel, U., Eggert, A., Fan, W., Hjøllø, S.S., Hufnagl, M., Huret, M., Ji, R., Lacroix, G., Peck, M.A., Radtke, H., Sailley, S., Sinerchia, M., Skogen, M.D., Travers-Trolet, M., Troost, T.A., van de Wolfshaar, K.
- [2018] [The UKC2 regional coupled environmental prediction system.](#)
- Reference:** Geosci. Model Dev. 11, 1–42.
- Lewis, H.W., Castillo Sanchez, J.M., Graham, J., Saulter, A., Bornemann, J., Arnold, A., Fallmann, J., Harris, C., Pearson, D., Ramsdale, S., Martínez-de la Torre, A., Bricheno, L., Blyth, E., Bell, V.A., Davies, H., Marthews, T.R., O'Neill, C., Rumbold, H., O'Dea, E., Brereton, A., Guihou, K., Hines, A., **Butenschön, M.**, Dadson, S.J., Palmer, T., Holt, J., Reynard, N., Best, M., Edwards, J., Siddorn, J.
- [2018] [Projections of change in key ecosystem indicators for planning and management of marine protected areas: An example study for European seas.](#)
- Reference:** Estuarine, Coastal and Shelf Science, Vectors of change in the marine environment 201, 172–184.
- Kay, S., **Butenschön, M.**
- [2018] [Defining scenarios of future vectors of change in marine life and associated economic sectors.](#)
- Reference:** Estuarine, Coastal and Shelf Science, Vectors of change in the marine environment 201, 164–171.
- Groeneveld, R.A., Bosello, F., **Butenschön, M.**, Elliott, M., Peck, M.A., Pinnegar, J.K.
- [2018] [Chapter 4: Projected changes in global and national potential marine fisheries catch under climate change scenarios in the twenty-first century.](#)
- Reference:** FAO Fisheries Technical Paper. FAO, Rome, Italy, pp. 63–86.
- Cheung, W.W.L., Bruggeman, J., **Butenschön, M.**
- in: Impacts of Climate Change on Fisheries and Aquaculture: Synthesis of Current Knowledge, Adaptation and Mitigation Options.,
- [2017] [The Cost of Reducing the North Atlantic Ocean Biological Carbon Pump.](#)
- Reference:** Frontiers in Marine Science 3:290.
- Barange, M., **Butenschön, M.**, Yool, A., Beaumont, N., Fernandes, J.A., Martin, A.P., Allen, J.I.
- [2016] [Quantitative pathways for Northeast Atlantic fisheries based on climate, ecological-economic and governance modelling scenarios.](#)
- Reference:** Ecological Modelling 320, 273–291.
- Mullon, C., Steinmetz, F., Merino, G., Fernandes, J.A., Cheung, W.W.L., **Butenschön, M.**, Barange, M.
- [2016] [Potential impacts of climate change on the primary production of regional seas: A comparative analysis of five European seas.](#)
- Reference:** Progress in Oceanography 140, 91–115.

Holt, J., Schrum, C., Cannaby, H., Daewel, U., Allen, I., Artioli, Y., Bopp, L., **Butenschön, M.**, Fach, B.A., Harle, J., Pushpadas, D., Salihoglu, B., Wakelin, S.

- [2016] [The assessment of a global marine ecosystem model on the basis of emergent properties and ecosystem function: a case study with ERSEM.](#)

Reference: Geosci. Model Dev. 9, 59–76.

de Mora, L., **Butenschön, M.**, Allen, J.I.

- [2016] [Decadal reanalysis of biogeochemical indicators and fluxes in the North West European shelf-sea ecosystem.](#)

Reference: J. Geophys. Res. Oceans 121, 1824–1845.

Ciavatta, S., Kay, S., Saux-Picart, S., **Butenschön, M.**, Allen, J.I.

- [2016] [ERSEM 15.06: a generic model for marine biogeochemistry and the ecosystem dynamics of the lower trophic levels.](#)

Reference: Geosci. Model Dev. 9, 1293–1339.

Butenschön, M., Clark, J., Aldridge, J.N., Allen, J.I., Artioli, Y., Blackford, J., Bruggeman, J., Cazenave, P., Ciavatta, S., Kay, S., Lessin, G., van Leeuwen, S., van der Molen, J., de Mora, L., Polimene, L., Sailley, S., Stephens, N., Torres, R.

- [2016] [Marine regime shifts in ocean biogeochemical models: a case study in the Gulf of Alaska.](#)

Reference: Biogeosciences 13, 4533–4553.

Beaulieu, C., Cole, H., Henson, S., Yool, A., Anderson, T.R., de Mora, L., Buitenhuis, E.T., **Butenschön, M.**, Totterdell, I.J., Allen, J.I.

- [2015] [Modelling the combined impacts of climate change and direct anthropogenic drivers on the ecosystem of the northwest European continental shelf.](#)

Reference: Journal of Marine Systems 152, 51–63.

Wakelin, S.L., Artioli, Y., **Butenschön, M.**, Allen, J.I., Holt, J.T.

- [2015] [Modelling the future biogeography of North Atlantic zooplankton communities in response to climate change.](#)

Reference: Mar Ecol Prog Ser 531, 121–142.

Villarino, E., Chust, G., Licandro, P., **Butenschön, M.**, Ibaibarriaga, L., Larraaga, A., Irigoien, X.

- [2015] [Placing biodiversity in ecosystem models without getting lost in translation.](#)

Reference: Journal of Sea Research, Protecting Marine Biodiversity to Preserve Ecosystem Functioning: a Tribut

Queirós, A.M., Bruggeman, J., Stephens, N., Artioli, Y., **Butenschön, M.**, Blackford, J.C., Widdicombe, S., Allen, J.I., Somerfield, P.J.

- [2015] [Predicting future thermal habitat suitability of competing native and invasive fish species: from metabolic scope to oceanographic modelling.](#)

Reference: Conserv Physiol 3, cou059.

Marras, S., Cucco, A., Antognarelli, F., Azzurro, E., Milazzo, M., Bariche, M., **Butenschön, M.**, Kay, S., Bitetto, M.D., Quattrocchi, G., Sinerchia, M., Domenici, P.

- [2015] [Building the capacity for forecasting marine biogeochemistry and ecosystems: recent advances and future developments.](#)
- Reference:** Journal of Operational Oceanography 8, s168–s187.
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- Reference:** Environ. Monit. Assess. 187, 1–22.
- Garmendia, M., Borja, Á., Breton, F., Butenschön, M., Marín, A., Miller, P.I., Morisseau, F., Xu, W.
- [2014] [What can ecosystem models tell us about the risk of eutrophication in the North Sea?](#)
- Reference:** Climatic Change 132, 111–125.
- Saux Picart, S., Allen, J.I., **Butenschön, M.**, Artioli, Y., Mora, L. de, Wakelin, S., Holt, J.
- [2014] [Modelling a light-driven phytoplankton succession.](#)
- Reference:** J. Plankton Res. 36, 214–229.
- Polimene, L., Brunet, C., **Butenschön, M.**, Martinez-Vicente, V., Widdicombe, C., Torres, R., Allen, J.I.
- [2014] [iMarNet: an ocean biogeochemistry model intercomparison project within a common physical ocean modelling framework.](#)
- Reference:** Biogeosciences 11, 7291–7304.
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- [2014] [Challenges in integrative approaches to modelling the marine ecosystems of the North Atlantic: Physics to fish and coasts to ocean.](#)
- Reference:** Progress in Oceanography 129, Part B, 285–313.
- Holt, J., Icarus Allen, J., Anderson, T.R., Brewin, R., **Butenschön, M.**, Harle, J., Huse, G., Lehodey, P., Lindemann, C., Memery, L., Salihoglu, B., Senina, I., Yool, A.
- [2014] [Biomass changes and trophic amplification of plankton in a warmer ocean.](#)
- Reference:** Glob. Change Biol. 20, 2124–2139.
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- [2014] [Heterogeneity of impacts of high CO2 on the North Western European Shelf.](#)
- Reference:** Biogeosciences 11, 601–612.
- Artioli, Y., Blackford, J.C., Nondal, G., Bellerby, R.G.J., Wakelin, S.L., Holt, J.T., **Butenschön, M.**, Allen, J.I.

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- Reference:** Global Change Biology 19, 2596–2607.
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- Reference:** Geosci. Model Dev. 6, 533–548.
- de Mora, L., **Butenschön, M.**, Allen, J.I.
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- Reference:** Ocean Science 9, 261–279.
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- Reference:** J. Geophys. Res. 117, C05020
- Wakelin, S.L., Holt, J.T., Blackford, J.C., Allen, J.I., **Butenschön, M.**, Artioli, Y.
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- Reference:** Geosci. Model Dev. 5, 223–230.
- Saux Picart, S., **Butenschön, M.**, Shutler, J.D.
- [2012] [Modelling xanthophyll photoprotective activity in phytoplankton.](#)
- Reference:** Journal of Plankton Research 34, 196–207.
- Polimene, L., Brunet, C., Allen, J.I., **Butenschön, M.**, White, D.A., Llewellyn, C.A.
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- Reference:** Biogeochemistry 110, 243–255.
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- Reference:** Ocean Sci. 8, 983–1000.
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- Reference:** Ocean Modelling 52–53, 36–53.

Butenschön, M., Zavatarelli, M., Vichi, M.

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Reference: Ocean Modelling 54–55, 37–54.

Butenschön, M., Zavatarelli, M.

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Reference: Journal of Marine Systems 102–104, 1–13.

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CONSENT

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.