

# DOROTEACIRO IOVINO

## PERSONAL INFORMATION

Address           Fondazione CMCC  
Euro-Mediterranean Center on Climate Change  
Via M. Franceschini 31, 40128 Bologna, Italy

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Nationality       Italian

## EDUCATION

- 2007   Ph.D. in Physical Oceanography, University of Bergen, Norway. Thesis: “*On the Nordic Seas' role in the stability of the Atlantic Meridional Overturning Circulation*”.  
Advisors: Prof. Helge Drange, Prof. Tor Eldevik, Dr. Fiammetta Straneo.
- 2001   Laurea cum laude, Università degli Studi di Napoli Parthenope. Thesis in Physical Oceanography: “*Modeling of oceanic wind driven fluctuations: general aspects and analysis of eddy viscosity biharmonic parameterization*”. Advisor: Prof. Stefano Pierini.

## PROFESSIONAL EXPERIENCE

July 2012 – present

Scientist at Euro-Mediterranean Center on Climate Change (CMCC), Bologna, Italy.

September 2007 – June 2012

Postdoctoral Researcher at the Laboratoire d'Océanographie et du Climat: Expérimentation Approches Numériques, Paris, France.

January – April 2006

Guest Student at the Woods Hole Oceanographic Institution, Woods Hole, MA, USA.

January 2004 – June 2007

PhD Student at the Nansen Environmental and Remote Sensing Center, Bergen, Norway.  
Norwegian project PROCLIM (Polar Ocean Climate Processes).

October 2002 – August 2003

Research Consultant at the Istituto Nazionale di Geofisica e Vulcanologia, Bologna, Italy.

April – September 2002

Research Fellowship at the Istituto Nazionale di Geofisica e Vulcanologia, Bologna, Italy.  
Advisor: Dr. Simona Masina. European project ENACT.

## **OTHER SCIENTIFIC ACTIVITIES**

Research Leader of the Ocean and Sea-Ice Modeling group within the Ocean Modeling and Data Assimilation Division at CMCC since 2015.

Member of the CLIVAR/CliC Northern Oceans Regional Panel (NORP) since 2017.

Member of the NEMO sea ice Working Group since 2016.

NEMO Officer for the CMCC within the NEMO System Team ([www.nemo-ocean.eu/About-Us](http://www.nemo-ocean.eu/About-Us)) since 2013.

NEMO Expert for the CMCC within the NEMO System Team for the 2012-2013 period.

Lecturer in the Ph.D. programme in Science and Management of Climate Change at CMCC/University Ca' Foscari:

- Polar Climate and Sea Ice, a.y. 2014/2015, 2015/2016, 2016/2017, 2017/2018.
- Polar Oceanography and Sea Ice, a.y. 2013/2014.
- Sea Ice and Polar Climate Dynamics, a.y. 2012/2013.

Proposal reviewer: European Research Council, The US National Science Foundation (NSF).

Scientific Paper Reviewer: Journal of Geophysical Research.

## **CURRENT PROJECTS**

ROMEO: Understanding the role of mesoscale eddies in the global ocean. Project awarded in the PRACE 15<sup>th</sup> Regular Call. 2017-2018.

PRIMAVERA: PRocess-based climate sIMulation: AdVances in high-resolution modelling and European climate Risk Assessment. European Union Horizon2020 project. 2015-2019. (WP coleader)

CMCC strategic projects (2016-2018):

- NEMO Evolution
- A Multi-hazards prediction and analysis testbed for the Global Coastal Ocean

## **PAST PROJECTS**

CATARSI: Climatically-driven changes in Antarctic sea ice and their role in the climate system. National Antarctic Research Program (PNRA), MIUR, 2014-2016. (coordinator)

GEMINA (MIUR/MATTM). 2012- 2015.

ENS4OCEAN: Ensemble-based approach for global ocean forecasting. Project awarded in the PRACE 8<sup>th</sup> Regular Call. 2014-2015.

Is-ENES: Infrastructure for the European Network for Earth System Modeling, 2011-2012.

THOR: Thermohaline Overturning at Risk? 2009-2010.

TWISTED: Toward Integration of Subgrid Turbulence in Ecosystem Dynamic. 2007-2009.

PROCLIM: Polar Ocean Climate Processes. 2004-2007.

## PUBLICATIONS

### PEER-REVIEWED

- Uotila et al.: An assessment of ten ocean reanalyses in the polar regions. *Climate Dynamics*, 2018. doi:10.1007/s00382-018-4242-z
- Cipollone, A., S. Masina, A. Storto, and **D. Iovino**: Benchmarking the mesoscale variability in global ocean eddy-permitting numerical systems. *Ocean Dynamics*, 67, 1313-1333, 2017. doi:10.1007/s10236-017-1089-5
- Haid, V., **D. Iovino**, and S. Masina: Impacts of freshwater changes on Antarctic sea ice in an eddy-permitting sea-ice–ocean model. *The Cryosphere*, 11, 1387-1402, 2017. doi:10.5194/tc-11-1387-2017
- Uotila, P., **D. Iovino**, M. Vancoppenolle, M. Lensu, and C. Rousset: Comparing sea ice, hydrography and circulation between NEMO3.6 LIM3 and LIM2. *Geosci. Model Dev.*, 10, 1009-1031, 2017. doi:10.5194/gmd-10-1009-2017
- Stepanov V., **D. Iovino**, S. Masina, A. Storto, A. Cipollone: Observed and simulated variability of the Atlantic Meridional Overturning Circulation at 41°N. *Journal of Marine Systems*, 164, 42-52, 2016. doi: 10.1016/j.jmarsys.2016.08.004
- Stepanov, V., **D. Iovino**, S. Masina, A. Storto, A. Cipollone: The impact of horizontal resolution of density field on the calculation of the Atlantic meridional overturning circulation at 34°S. *Journal of Geophysical Research – Ocean*, 121, 2016. doi: 10.1002/2015JC011505
- Stepanov, V., **D. Iovino**, S. Masina, A. Storto, A. Cipollone: Methods of calculation of the Atlantic meridional heat and volume transports from ocean models at 26.5°N. *Journal of Geophysical Research – Ocean*, 121, 1459–1475, 2016. doi:10.1002/2015JC01100
- **Iovino, D.**, S. Masina, A. Storto, A. Cipollone, and V. N. Stepanov: A 1/16° eddying simulation of the global NEMOv3.4 sea ice-ocean system. A 1/16° eddying simulation of the global NEMOv3.4 sea ice-ocean system. *Geosci. Model Dev.*, 9, 2665-2684, 2016. doi:10.5194/gmd-9-2665-2016
- Ilicak, M., et al.: An assessment of the Arctic Ocean in a suite of interannual CORE-II simulations. Part III: Hydrography and fluxes. *Ocean Modelling*, 100, 141-161, 2016.

doi:10.1016/j.ocemod.2016.02.004

- Wang, Q. et al.: An assessment of the Arctic Ocean in a suite of interannual CORE-II simulations. Part II: Liquid freshwater. *Ocean Modelling*, 99, 86-109, 2016. doi:10.1016/j.ocemod.2015.12.009
- Wang, Q. et al.: An assessment of the Arctic Ocean in a suite of interannual CORE-II simulations. Part I: Sea ice and solid freshwater. *Ocean Modelling*, 99, 110-132, 2016. doi:10.1016/j.ocemod.2015.12.008
- Colleoni, F., S. Masina, A. Cherchi, and **D. Iovino**: Impact of Orbital Parameters and Greenhouse Gas on the Climate of MIS 7 and MIS 5 Glacial Inceptions. *Journal of Climate*, 27, 8918–8933, 2014. doi:10.1175/JCLI-D-13-00754.1
- Lévy, M., L. Resplandy, P. Klein, X. Capet, **D. Iovino**, C. Ethé: Grid degradation of submesoscale resolving ocean models: Benefits for offline passive tracer transport. *Ocean Modelling*, 48, 1-9, 2012. doi:10.1016/j.ocemod.2012.02.004
- Lévy, M., **D. Iovino**, L. Resplandy, P. Klein, G. Madec, A.-M. Treguier, S. Masson, K. Takahashi: Large-scale impacts of submesoscale dynamics on phytoplankton: local and remote effects. *Ocean Modelling*, 43-44, 77-93, 2011. doi:10.1016/j.ocemod.2011.12.003
- Lévy, M., P. Klein, A.-M. Treguier, **D. Iovino**, G. Madec, S. Masson, and K. Takahashi: Modification of gyre circulation by sub-mesoscale physics. *Ocean Modelling*, 34, 1-15, 2010. doi:10.1016/j.ocemod.2010.04.001
- Lévy, M., **D. Iovino**, S. Masson, G. Madec, P. Klein, A.-M. Treguier, and K. Takahashi: Remote impact of Sub-Mesoscale Dynamics on new production. *Mercator Ocean Quarterly Newsletter*, 35, 13-19, 2009.
- Eldevik, T., J.E.Ø. Nilsen, **D. Iovino**, K.A. Olsson, A.B. Sandø, and H. Drange: Observed sources and variability of Nordic seas overflow. *Nature Geoscience*, 2, 406-410, 2009. doi:10.1038/NGEO518
- **Iovino, D.**, F. Straneo, M.A. Spall: On the effect of a sill on dense water formation in a marginal sea. *Journal of Marine Research*, 66, 325-345, 2008. doi:10.1357/002224008786176016

#### OTHER MANUSCRIPTS

- NEMO System Team: Main achievements for NEMO evolution during Myocean period. *Mercator Ocean Quarterly Newsletter*, 54, 94-101, 2016.
- **Iovino D.**, A. Storto, S. Masina, A. Cipollone, and Vladimir Stepanov: GLOB16, the CMCC global mesoscale-eddy ocean. Research Papers Issue RP0247, 2014.

- Fogli P.G., **D. Iovino**: CMCC–CESM–NEMO: toward the new CMCC Earth System Model. Research Papers Issue RP0248, 2014.
- **Iovino, D.**, M. Vancoppenolle, T. Fichefet: Implementation of LIM sea ice model in the CMCC global ocean high-resolution configuration. Research Papers Issue RP0209, 2013.
- **Iovino, D.** and T. Eldevik: Fundamental aspects of the thermohaline gyre circulation in an idealized North Atlantic Ocean. In *On the Nordic Seas role in the Atlantic Meridional Overturning Circulation*, D. Iovino, Ph.D. Thesis published by Bergen Open Research Archive, 2007.
- Eldevik, T., J.E.Ø. Nilsen, **D. Iovino**, K.A. Olsson, and A.B. Sandø, 2007: The Greenland Sea does not control the overflows feeding the Atlantic conveyor. In *On the Nordic Seas role in the Atlantic Meridional Overturning Circulation*, D. Iovino, Ph.D. Thesis published by Bergen Open Research Archive, 2007.
- Bray, A.P., F. Geyer, J. Hazewinkel, C. Hopland, **D. Iovino**, N. Kaland, A.H. Larsen, K.S. Sponheim, M.J. Stott: Measurements in Sognefjorden Spring 2004. Scientific report, 2004.

## COMMUNICATIONS

- 2018 ○ *Arctic and Antarctic Sea Ice in Ten Ocean Reanalyses*. Polar 2018. Davos, Switzerland
- *Antarctic Sea Ice Response to Climate Changes in a Model Study*. Polar 2018. Davos, Switzerland
- *GOFS16: a Global Ocean Forecast System at eddying resolution*. Geophysical Research Abstracts, Vol. 20. EGU General Assembly, Wien, Austria.
- *Polar Ocean Reanalyses Intercomparison Project*. Evaluation of Ocean Syntheses meeting, COST Action ES1402, Malta.
- 2017 ○ *CMCC Global Eddying sea-ice–ocean system*. The 7<sup>th</sup> China-Italy Collaboration Workshop on Operational Oceanography and Regional Climate Change. Rome, Italy.
- 2016 ○ *Climatically-driven changes of Antarctic Sea Ice*. AGU Fall Meeting. San Francisco (CA), USA.
- *CMCC Global Ocean-Sea Ice System for Reanalysis and Forecasting Applications*. CMCC-JAMSTEC symposium: Workshop for modeling and prediction of climate variability and change and its social applications. Aizu, Japan.
- *Methods of calculation of the Atlantic meridional transports at 26.5°N from ocean models*. Geophysical Research Abstracts, Vol. 18. EGU General Assembly, Wien, Austria.
- *A 1/16° eddying simulation of the global ocean/sea ice system*. Geophysical Research Abstracts, Vol. 18. EGU General Assembly, Wien, Austria.
- *A 1/16° eddying simulation of the global ocean/sea ice system*. Workshop on high-resolution ocean modelling for coupled seamless predictions. Exeter, UK.
- *The CMCC ocean reanalysis in polar regions*. Polar Ocean Reanalysis Intercomparison. Helsinki, Finland.
- 2015 ○ *The CMCC global eddying ocean*. CMCC-JAMSTEC symposium on predictability and

- applicability of climate variations and change. Bologna, Italy.
- *A comparison of LIM2 and LIM3 between two NEMOv3.4 simulations in the ORCA025 grid.* DRAKKAR/MYOCEAN 2015 Annual Workshop, Grenoble, France.
- 2014
- *Smelting og ferskvann svekker ikke nødvendigvis Atlanterhavsstrømmen.* Norwegian Geophysical Society symposium, Oslo, Norway.
  - *What's new in NEMO's use and development for the CMCC.* NEMO Users meeting 2014, Grenoble, France.
  - *Modeling the sea ice-ocean system at eddy-resolving resolution.* CMCC Annual Meeting, Ugento, Italy.
  - *Denmark Strait circulation scheme in an eddy-resolving model.* CMCC Annual Meeting, Ugento, Italy.
  - *Climatically driven changes of Antarctic sea ice and their role in the climate system.* ESF exploratory workshop - oceanic heat transport to floating glaciers in Antarctica, Lerici, Italy.
  - *Ocean Modeling at CMCC.* CLIVAR WGOMD Workshop on High Ocean Climate Modeling, Kiel, Germany.
  - *Denmark Strait overflow in an eddy-resolving model.* CLIVAR WGOMD Workshop on High Ocean Climate Modeling, Kiel, Germany.
  - *Denmark Strait Circulation Scheme in an eddy-resolving model.* Ocean Science Meeting, Honolulu, Hawaii, USA.
- 2013
- *On the sensitivity of modeled sea ice.* CMCC Annual Meeting, Ugento, Italy.
- 2012
- *Dynamics of the Norwegian Atlantic Current from high-resolution modeling and observations.* 16<sup>th</sup> AOMIP workshop, Woods Hole Oceanographic Institution, Woods Hole, MA, USA.
  - *The role of the mesoscale dynamics in the transformation of Atlantic water within the Nordic Seas.* The Bjerknes Center's 10<sup>th</sup> Anniversary Conference: Climate change in high latitudes, Bergen, Norway.
  - *Dynamics of the Norwegian Atlantic Current from high-resolution modeling and observations.* The Bjerknes Center's 10<sup>th</sup> Anniversary Conference: Climate change in high latitudes, Bergen, Norway.
  - *Impact of the Nordic Seas mesoscale dynamics on the exchanges over the Greenland Scotland Ridge to the Atlantic MOC.* IPY 2012, Montreal, Canada.
- 2011
- *Impact of ice-ocean model resolution in the Nordic Seas on the simulated exchanges over the Greenland-Scotland sills.* THOR annual meeting, Bergen, Norway.
  - *Variability of ocean convection in the Nordic Seas during the last two decades: sensitivity to model resolution and parameterization.* 15<sup>th</sup> AOMIP workshop, Woods Hole Oceanographic Institution, Woods Hole, MA, USA.
  - *Large-scale impacts of sub-mesoscale dynamics on phytoplankton. Local and remote effects.* EGU General Assembly, Wien, Austria.
- 2010
- *The influence of the Arctic Ocean fresh water content on the fresh water outflow to the Atlantic MOC.* THOR annual meeting, Copenhagen, Denmark.
  - *Observed Sources and Variability of Nordic Seas overflow.* IPY Oslo Science Conference, Oslo, Norway.
  - *Impact of sub-mesoscale dynamics on biogeochemical budgets in an idealized North*

- Atlantic Ocean. Ocean Sciences Meeting 2010, Portland, OR, USA.*
- 2009
- *Impact of sub-mesoscale dynamics on biogeochemical budgets in an idealized ocean.* ASLO Aquatic Science Meeting, Nice, France.
  - *Modification of sub-surface nutrient reservoir and new production by sub-mesoscale physics.* LOCEAN, Paris, France.
- 2008
- *Impact of sub-mesoscale dynamics on biogeochemical budgets.* TWISTED Workshop, Paris, France.
  - *Impact of sub-mesoscale physics on the biogeochemical equilibrium of idealized oceanic gyres.* Geophysical Research Abstracts, Vol. 10. EGU General Assembly, Wien, Austria.
  - *On the effect of a sill on dense water formation in a marginal sea gyres.* Geophysical Research Abstracts, Vol. 10. EGU General Assembly, Wien, Austria.
  - *On the effect of a sill on dense water formation in a marginal sea.* Ocean Sciences Meeting 2008, Orlando, FL, USA.
- 2007
- *Nordic Seas and the North Atlantic Conveyor.* CMCC, Bologna, Italy.
  - *On the Nordic Seas' role in the Atlantic Meridional Overturning Circulation.* Invited talk at MISU, Stockholm, Sweden.
  - *On the Nordic Seas' role in the Atlantic Meridional Overturning Circulation.* Invited talk at LOCEAN, Paris, France.
  - *Evidence for atmosphere-ocean coupling in decadal to multi-decadal variations in the Atlantic Meridional Overturning Circulation.* NERSC, Bergen, Norway.
  - *Tracing the Greenland Sea to "The great ocean conveyor".* CLIVAR Workshop on the North Atlantic Subpolar Gyre, Germany.
- 2006
- *Does the sill affect dense water formation in the Nordic Seas?* Bjerknes Centre for Climate Research workshop, Bergen, Norway.
  - *Little trace of the Greenland Sea in the Atlantic Conveyor.* RAPID Climate Change Meeting, Birmingham, UK.
- 2005
- *Fundamental aspects of the thermohaline gyre circulation in an idealized North Atlantic.* Invited talk at INGV, Bologna, Italy.
  - *On the influence of basin configuration on the North Atlantic Meridional Overturning Circulation.* Bjerknes Centre for Climate Research seminar, Geilo, Norway.
  - *On the Overturning Circulation in an idealized North Atlantic-Nordic Seas System.* Geophysical Research Abstracts, Vol. 7. EGU General Assembly, Wien, Austria.
- 2004
- *On the Nordic Seas' role in the Meridional Overturning Circulation.* Norwegian Meteorological Institute, Oslo, Norway.
  - *On the Nordic Seas' role in the North Atlantic Circulation.* Nansen Zhu International Research Centre, Beijing, Center in Beijing, China.
  - *On the structure of the Meridional Overturning Circulation for distinct cases of surface forcing and basin configuration.* CLIVAR Workshop on North Atlantic Thermohaline Circulation Variability, Kiel, Germany.
  - *On the influence of SST and basin configuration on the Meridional Overturning Circulation.* Bjerknes Centenary 2004, Bergen, Norway.
  - *Influence of idealized forcing and basin configuration on the Atlantic Meridional*

- *Overturning Circulation*. Notur 2004, Tromsø, Norway.
- *Influence of idealized forcing and basin configuration on the Atlantic Meridional Overturning Circulation*. Geophysical Research Abstracts, Vol. 6. EGU Assembly, Nice, France.
- 2003 ○ *Decadal climate variability in the upper North Atlantic detected in an ocean analysis*. Geophysical Research Abstracts, Vol. 5. EGU Assembly, Nice, France.

## AWARDS

*Best Abstract*: 5<sup>th</sup> Annual Conference of the Italian Society for Climate Sciences (SISC), Bologna, Italy, 2017

*Best Poster*: CMCC Annual Meeting, Ugento, Italy, June 2014.

## WORKSHOPS AND SCHOOLS

- 2017 ○ Artico - Ultima frontiera. Summit on Climate Change. Venice, Italy.
- NEMO in CMIP6 workshop. Grenoble, France.
- 2016 ○ NEMO in CMIP6 workshop. Grenoble, France.
- Drakkar/ 2016 annual workshop. Grenoble, France.
- 2015 ○ School on Ocean Climate Modelling: Physical and Biogeochemical Dynamics of Semi-enclosed seas. METU, Ankara, Turkey.
- Copernicus Marine Environment Monitoring Service (CMEMS) Workshop. Brussels, Belgium.
- Workshop on “Southern Ocean and sea ice in a warming world” and “Antarctic ice sheet and sea level”, Conferenza nazionale sulla ricerca in Antartide, Rome, Italy.
- Drakkar/MyOcean 2015 annual workshop. Grenoble, France.
- 2014 ○ ESF Exploratory Workshop - Oceanic Heat Transport To Floating Glaciers In Antarctica. Lerici, Italy.
- CLIVAR WGOMD Workshop on High Ocean Climate Modeling, Kiel, Germany.
- 2013 ○ International Workshop on The Climate Challenge in the Arctic. ICCG, Island of San Giorgio Maggiore, Venice, Italy.
- Drakkar/MyOcean 2013 annual workshop. Grenoble, France.
- 2012 ○ Agrif developers training, Grenoble, France.
- Drakkar/MyOcean 2012 annual workshop. Grenoble, France.
- 2011 ○ School of parallel computing. CINECA, Bologna, Italy.
- Drakkar/MyOceanWP3 annual workshop. Grenoble, France.
- 2010 ○ 14<sup>th</sup> AOMIP workshop, Woods Hole Oceanographic Institution, Woods Hole, MA, USA.
- 2008 ○ Nonlinear processes in oceanic and atmospheric flows. Castro Urdiales, Cantabria, Spain.



- 2006 ○ Buoyancy loss in the Nordic Seas: A driver of the Atlantic Conveyor? Bjerknes Centre for Climate Research, Bergen, Norway.
- 2004 ○ The first NZC summer school. Nansen Zhu International Research Centre, Beijing, Center in Beijing, China.
- 2003 ○ Ventilation, pathways and overflows of the Nordic Seas. Geophysical Institute, University of Bergen, Bergen, Norway.
- 2002 ○ El Nino and tropical ocean-atmosphere interactions. ICTP (Abdus Salam International Centre for Theoretical Physics), Trieste, Italy.
- 2000 ○ International summer school on atmospheric and oceanic sciences. University of L'Aquila, Italy.

### FIELD WORK

R/V Hakon Mosby cruise, Sognefjord, Norway, February 2004.

PRISMA 2 Project, Adriatic Sea, April 1997.

Several field campaigns in the Gulf of Naples for the Oceanographic Measurements Course (Università degli Studi di Napoli Parthenope).

### MISCELLANEOUS

Work experience in scientific vulgarization (climate change, mean state and variability of the ocean, marine ecosystems).

#### Computer skill

Systems: UNIX, Mac OS-X, Windows.

Programming languages: Fortran 77/90

Scientific software and visualization: Matlab, IDL, Python.

Office software (LaTeX, Office suites) and Web Design (HTML, CSS).

#### Languages:

Italian: mother tongue

English: proficient user in understanding, speaking and writing.

French: intermediate user.

Spanish and Norwegian: basic user.

Scuba technician for control and managing of fish replenishment areas.