Massimo Muraro

ABOUT MYSELF

I have a scientific background acquired during my studies, subsequently cultivated and deepened during my work experiences. I have always been interested in environmental issues and innovation.

Over the years, I have acquired excellent IT skills which has allowed me to play a role in connecting and harmonizing the domain issues and the most appropriate technological needs and solutions.

By nature I am curious and predisposed to in-depth analysis and research into the topics addressed.

I like working in a team but I am used to organizing and carrying out my tasks in complete autonomy.

Significant experiences

2010: technical contact in the development (Byte-Code company) of a web-oriented application for the production of bulletins for the prediction of ozone levels on homogeneous areas. Recently technical contact for the redesign of the application with technology updates (Simevo company);

2008: supporter and coordinator of the technical group (Arpa Piemonte, Arianet company, Cineca inter-university consortium) for the parallel rewriting (hybrid parallelisation) of the photochemical Eulerian model of dispersion and deposition (dry and wet) of FARM (Flexible Air quality Regional) pollutants Model). Currently the FARM model is an open-source resource used with great prevalence in the Agency system and by the Ministry of the Environment within the MINNI system (National Integrated Model to support international negotiation on air pollution issues);

2007/2008: member of the technical group which, during the migration of the Arpa headquarters, was responsible for moving the server room of the Functional Center without any interruption of service;

since 2007 and still ongoing: advocate and coordinator of the migration of Arpa Piemonte's operational forecasting modeling chain for air quality onto high performance computing (HPC) systems through a contract with the Cineca inter-university consortium and subsequent renewals (three-yearly) . Editor of the technical specifications of the tender notices and therefore Executive Director of the Contract. Currently among those responsible for the management and maintenance of the operational modeling chain;

2006: in the working group (Arpa Piemonte, Arianet company) for the creation of the first operational forecasting modeling chain for the prediction of concentrations of pollutants in the atmosphere in Italy;

WORK EXPERIENCE

Euro-Mediterranean Center on Climate Change Foundation (CMCC)

City: Lecce | **Country:** Italy

[02/04/2025 – Current] **Senior Research Associate**

support to the REMHI (REgional Models and geo-Hydrological Impacts) division in the development and optimization of weather/climate modeling and associated impacts, improving existing operational chains and contributing to the development of new applications also focused on the study of air quality in urban environments and on data assimilation

Arpa Piemonte

City: Torino | **Country:** Italy

[16/04/2004 – 01/04/2025] **Professional Technical Collaborator Expert in the profile of health professionals and officials; currently on hold**

operational and applied research tasks, with particular attention to environmental micrometeorology, local-scale meteorological modeling and air pollution issues;

implementation and management of the departmental IT and processing infrastructure and the internal information system;

specific expertise in the management, implementation and development of applications;

experience and specific expertise in the implementation and configuration of meteorological and dispersive modeling chains and in the related operational management, at the high performance computing (HPC) center of the CINECA Consortium.

CSI Piemonte

City: Torino | **Country:** Italy

[01/01/2004 – 16/04/2004] **environmental expert**

- operational and forecasting activities in the meteorological field,
- development of procedures for specific use,
- applied research activity with particular attention to environmental micrometeorology and meteorological modeling on a local scale.

Link s.n.c.

City: Torino | **Country:** Italy

[01/11/1999 – 31/12/1999] **Consultant at CSI Piemonte as an environmental expert**

- operational and forecasting activities in the meteorological field,
- development of procedures for specific use,
- applied research activity with particular attention to environmental micrometeorology and meteorological modeling on a local scale.

Link s.n.c.

City: Torino | **Country:** Italy

[01/02/1998 – 30/10/1999] **Developer**

- development and maintenance of software for the acquisition and management of meteorological and environmental data from the monitoring networks (meteorological, hydrological, chemical parameters) of the Piedmont Region.

Assioma p.s.c.r.l.

City: Milano | **Country:** Italy

[01/07/1997 – 31/01/1998] **Application system administrator**

- Consulting activity at Omnitel for the management of processes relating to Omnitel rechargeable card services.

Assioma p.s.c.r.l.

City: Torino | **Country:** Italy

[01/05/1997 – 30/06/1997] **Developer**

- consultancy activity at CSI Piemonte for the development of meteorological data management and visualization software.

EDUCATION AND TRAINING

[03/12/1996] **Degree in Physics (application focus, Environmental Physics orientation)**

Faculty of Mathematical, Physical and Natural Sciences of the University of Milan

City: Milano │ **Country:** Italy │

[1988] **Scientific high school diploma**

"Giulio Casiraghi" scientific high school in Cinisello Balsamo (Milan)

City: Sesto San Giovanni (Milano) │ **Country:** Italy │

[11/2024] **Machine Learning for weather and climate**

Arpa Piemonte internal course delivered in online mode

City: Tourin │ **Country:** Italy │

[12/2023 – 04/2024] **Advanced Postgresql Course**

Arpa Piemonte internal course provided by Kamedata srl in online mode

City: Torino │ **Country:** Italy │

[06/2023 – 12/2023] **MetView course**

Arpa Piemonte internal course provided by the CINECA Consortium in online mode

City: Torino │ **Country:** Italy │

[02/2023] **Python for Scientific Computing**

Course provided by the CINECA inter-university consortium in online mode

City: Torino │ **Country:** Italy │

[10/2022] **Digital tools for collaborative activities - Outlook training: using email**

Arpa Piemonte internal course delivered online

City: Torino │

[10/2022] **Introduction to Python programming**

Course provided by the CINECA inter-university consortium in online mode

City: Torino │ **Country:** Italy │

[06/2022] **Harassment in the workplace and gender discrimination**

Arpa Piemonte internal course delivered online

[05/2022] **PHP language**

Internal course organized by Arpa Piemonte provided by the Simevo company in person (headquarters)

City: Torino │ **Country:** Italy │

[12/2021] **Practical and Complete Guide to Django, Python and Bootstrap**

e-learning modules provided by the company Udemy Ireland, Ltd - online mode

City: Torino | **Country:** Italy |

[12/2021] **Developer's Guide to Django REST Framework and Vue JS**

e-learning modules provided by the company Udemy Ireland, Ltd - online mode

City: Torino | **Country:** Italy |

[12/2020] **Workplace safety risks related to smart working: your muscular health**

Internal course organized by Arpa Piemonte, delivered online

City: Torino | **Country:** Italy |

[02/2013] **Java training mod II**

Internal course organized by Arpa Piemonte, delivered by Byte-Code in person (headquarters).

City: Torino | **Country:** Italy |

[01/2013] **Java training mod I**

Internal course organized by Arpa Piemonte, delivered in presence mode (headquarters).

City: Torino | **Country:** Italy |

[06/2012] **Control of Physical Agents: Environment, Health and Quality of Life**

Training event organized by Arpa Piemonte

City: Novara | **Country:** Italy |

[11/2011] **Introduction to R**

Internal course organized by Arpa Piemonte, delivered in presence mode (headquarters)

City: Torino | **Country:** Italy |

[11/2011] **Advanced course on open GIS software for managing geographic databases (Qgis, GRASS)**

Internal course organized by Arpa Piemonte delivered by Faunalia in person (headquarters)

City: Torino | **Country:** Italy |

[03/2010] **Understanding Environmental Phenomena: Chemistry of Pollutants**

Internal course organized by Arpa Piemonte, delivered by the University of Turin in person

City: Torino | **Country:** Italy |

[02/2010] **Introduction to OpenMP Programming on Parallel Systems**

Course organized and delivered by the CINECA Consortium at Arpa Piemonte (headquarters)

City: Torino | **Country:** Italy |

[02/2010] **Introduction to scientific programming**

Course organized and delivered by the CINECA Consortium at Arpa Piemonte (headquarters)

City: Torino ｜ **Country:** Italy ｜

[03/2009] **Environmental Control of Physical Agents: New Perspectives and Emerging Issues**

Training event organized by Arpa Piemonte

City: Vercelli ｜ **Country:** Italy ｜

[10/2007] **Participation in the Virtualization Workshop, organized by RedHat Italia**

Event organized by Arpa Piemonte at CSI Piemonte

City: Torino ｜ **Country:** Italy ｜

[2005] **RH131 System Administrator**

Internal course organized by Arpa Piemonte, delivered by RedHat in person at CSI Piemonte

City: Torino ｜ **Country:** Italy ｜

[09/2005] **Global Earth-System Monitoring**

Seminar at ECMWF

City: Reading ｜ **Country:** United Kingdom ｜

[11/2003] **Introduction to micrometeorology and dispersion of pollutants in air**

Course organized in person by Arpa Basilicata

City: Matera ｜ **Country:** Italy ｜

[06/2003] **Introduction to data assimilation**

Introduction to data assimilation

City: Torino ｜ **Country:** Italy ｜

[04/2003] **Introduction to Atmospheric Turbulence**

Course organized in presence mode by ISAFoM CNR Campania

City: Ercolano ｜ **Country:** Italy ｜

[12/2002] **A Multiscale Approach to Environmental Modeling**

Technical seminar at CSI Piemonte

City: Torino ｜ **Country:** Italy ｜

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING B1 **READING** B1 **WRITING** A2

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

French

LISTENING B2 **READING** B2 **WRITING** B1

SPOKEN PRODUCTION B1 **SPOKEN INTERACTION** B1

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

SKILLS

Operating systems

Linux ｜ Unix ｜ Windows

Database

PostgreSQL | Oracle | SQLite | MySQL

Programming languages

shell (bash, ksh, sh) | Fortran77 | Fortran90/95 | C | python2/3 | SQL | R

Software applications

MS-Office | OpenOffice/LibreOffice | GrADS | MetVIEW | Dbeaver | SquirrelSQL

GIS applications

GDAL | Qgis | GRASS | PostGis | SpatiaLite | georeferenced formats (shapefile, Grib1/2, NetCDF, GeoJSON, GeoParquet)

Parallel Computing (HPC)

Job Scheduler (PBS Pro, Slurm Workloadmanager) | Parallel environment (OpenMP, Open MPI)

Collaborative development environment (CDE)

GitHub | GitLab | Version Control Systems (SVN, Git)

Virtualization e containerization

kvm | Virtual Machine manager | docker | podman | distrobox

PROFESSIONAL SKILLS

Domain: Meteorology – Advanced Professional

- University education;
- Modeling:
    - installation and configuration of meteorological models (Cosmo, WRF) in an HPC environment,
    - use for research activities;
- Operational activity: 1999 – 2006 weather operator at the *Operations Room – Functional Center of the Piedmont Region*;

Domain: Air Quality – Advanced Professional

- University education;
- Modeling:
    - installation and configuration of dispersive models in an operational environment and in an HPC environment;
    - contributor to the Eulerian Farm model;
    - Operational and research use of dispersive models;
- Operational activity: design, development, implementation, maintenance of operational procedures and modeling chains in an operational environment and in an HPC environment;

Operating systems

*Linux – **Advanced***

- Installation and configuration;
- Sysadmin;
- Virtualization and containerization;

*Unix – **Basic***

- Expert user;

*Windows – **Intermediate***

- Installation and configuration;
- Expert user;
- Configuration of users and access privileges;

Development - Advanced

- OOP and POP programming;
- Use of CDE and VCS;
- Debugging and profiling;
- Packaging;

Database - Advanced

- Installation and configuration;
- Creation of instances;
- Database design and implementation;
- Interaction with programming languages;

GIS Systems - Intermediate

- Use of applications;
- Knowledge of formats;
- Interaction with programming languages;

PUBLICATIONS

[2013] **"Operational multiscale modelling system for air quality forecast"**

Reference: Giorcelli M., Bande S., Muraro M., Milelli M.

COSMO NEWSLETTER,vol. 13, p.58-63

[2009] **"Meteo-diffusion analysis: the case study of the city of Turin"**

Reference: Poncino S., Bande S., Muraro M.

Epidemiologia & Prevenzione, anno 33 (6) novembre-dicembre 2009, supplemento 1, 27-33

[2008] **"Meteorological modelling influence on regional and urban air pollution predictability"**

Reference: Bande S., D'Allura A., Finardi S., Giorcelli M., Muraro M.

HRVATSKI METEOROLOSKI CASOPIS – CROATIA METEOROLOGICALJOURNAL, vol. 43, p. 613-617, ISSN: 1330-0083, 2008

[2008] **"Influence of meteorological modeling on the predictability of air pollution at regional and urban scales"**

Reference: Giorcelli M., Bande S., Muraro M.

Relazione della Provincia di Torino Uno Sguardo all'aria 2008, pp141-159,2008

[2006] **"Aerosol modeling and crticities related to input data collection: an example of a complete three dimensional data-set for the northen Italy"**

Reference: Angelino E., Bande S., Cascone C., De Maria R., Muraro M., Minguzzi E., Mossetti S., e altri

Chemical Engineering Transactions Volume 10, 2006, 233-239,ISBN 88-901915-7-0

[2019] **"Integrated modeling for source supply estimates to support air quality management in Piedmont"**

Reference: Bande S., Bissardella F., Cascone C., Clemente M., De Maria R., Ghigo S., Ronchi C., Muraro M.

Atti VII Convegno Nazionale Agenti Fisici, Stresa, 5-7 giugno 2019

"Public information under the new 50/2008/EC directive: an example of air quality forecast index"

[2010]

Reference: M. Giorcelli, L. Pallavidino, S. Bande, A. Bertello, A. D'Allura, S. Finardi, M. Muraro, R. Prandi

Proceedings of the 13th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Paris, France, May 2010

"Meteorological modellig influence on regional and urban air pollution predictability"

[2008]

Reference: Bande S., D'Allura A., Finardi S., Giorcelli M., Muraro M.

Proceedings of 12th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Cavtat, Croatia,6-9 ottobre 2008

"The modelling system supporting Piemonte region yearly air quality assessment". Proceedings of the 6th International conference on Urban Air Quality"

[2007]

Reference: Bande S., Clemente M., De Maria R., Muraro M., Picollo ME., Calori G. Finardi S., Silibello C.

Proceedings of the 6th International conference on Urban Air Quality". Limassol, Cyprus, marzo 2007.

"Sensitivity analysis of parameters influencing estimated by a Chemical Transport Model"

[2007]

Reference: De Maria R., Clemente M., Bande S., Muraro M., Silibello C.

Proceedings of 11th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Cambridge,U.K,2- 5 luglio 2007

[2007] **"An air quality forecasting modelling system for Novara Province, northern Italy"**

Reference: Pittini T., Morselli M.G., Finardi S., D'Allura A., Guerrini E., Manazza S., Muraro M., Bande S.

Proceedings of the11th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes Cambridge,U.K, 2- 5 luglio2007

[2007] **"Use of GIS in the context of Air Quality Assessment"**

Reference: Arduino G., Bande S., Clemente M., De Maria R., Muraro M., Calori G., Finardi S., Silibello C.

Atti 11^a Conferenza Nazionale A.S.I.T.A (Federazione delle Associazioni Scientifiche per le Informazioni Territoriali e Ambientali), Torino, 6-9 novembre 2007

"Multiscale modelling system for pollutant concentration predictions in urban areas"

[2007]

Reference: Bande S., Clemente M., De Maria R., Muraro M., Finardi S., Giorcelli M.,Morselli M.

Atti Workshop on Air Pollution in urban areas:Torino, Milano, Lyon, London, GEAM- Politecnico di Torino, Torino, 7 novembre 2007

[2004] **"Models for the assessment, prediction and management of air quality at a regional scale"**

Reference: Deserti M., Angelino E., Minguzzi E., Stortini M., Cascone C., Bande S., Muraro M. e altri

Rapporto Tecnico, APAT CTN-ACE, 2004

VOLUNTEERING

[2021 – Current] **Supporter of Amnesty International**

[2011 – Current] **Supporter of UNHCR**

[2007 – 2015] **Girotondo Committee**

Voluntary association that operates, mainly in Ukraine and Italy, to create and facilitate the conditions in which children can grow up healthy and with equal possibilities of physical and intellectual development. The Association operated for many years in Belarus, until external conditions allowed it.

Board member, manager and coordinator of the local *Turin – Rivoli* group.

[1992 – 1996] **A Smile for Bosnia**

Volunteering initiative in association with Acli Milano, for projects of friendship, cooperation, sports entertainment and cultural exchanges in reception centers for families in forced exodus from their territories of origin due to ethnic and religious clashes in Yugoslavia.

Member of the national secretariat, manager and coordinator of the local *Vanzago – Sesto San Giovanni* group.

FASCINATIONS

Open access culture

Open source, open science, open data, open borders;

Technological innovation

Reparability, reuse, sustainability, circular economy;

Animal Kingdom

Rom, Sinti, Camminanti