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Dr. A.M.R. (Roxana) Petrescu

Nationality: Romanian **Email address:** roxana.petrescu@cmcc.it

Website: https://nl.linkedin.com/in/a-m-roxana-petrescu-b8b89019

ABOUT ME

I am an environmental engineer with a PhD in environmental sciences and hydrology, and over 15 years of experience related to emissions of greenhouse gases. I was and currently am involved in European funded research projects such as: VERIFY, $CoCO_2$, AVENGERS and IM^{4}CA, where my work focuses on the assessment and verification of observation- and inventory based (bottom-up and top-down) scientific estimates with UNFCCC official GHG inventories. Next to research, I am performing project management tasks, such as communication and dissemination, user engagement and stakeholder outreach activities.

WORK EXPERIENCE

CMCC Foundation: Euro-Mediterranean Center on Climate Change – Viterbo, Italy

City: Viterbo | **Country:** Italy

Senior Researcher

[22/09/2025 – Current]

Research activities within the EU-funded AVENGERS project (https://avengers-project.eu/), responsible for data synthesis and liaison with national reporting agencies in WP1 "Requirements, Reporting, and Reconciliation." Support for WP6 (Input to International Programs) and WP4 (Process Attribution).

Research and coordination activities within the EU-funded IM^{4}CA project (https://im4ca.eu/). Lead for WP7 "Synthesis and Dissemination" and responsible for communication and dissemination activities and stakeholder engagement.

Vrije Universiteit Amsterdam – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Guest researcher

[02/01/2025 – 21/09/2025]

Research collaboration in the European Horizon funded projects IM^{4}CA and AVENGERS.
IM^{4}CA: leading the Synthesis and Outreach WP7 and I am part of the coordination team, in charge of the project's communication and dissemination activities and stakeholder involvement.
AVENGERS: in charge of the end project GHG synthesis paper in collaboration with WP1 national environmental reporting agencies.

European Commission - Joint Research Center – Ispra, Italy

City: Ispra | **Country:** Italy

Expert contract - consultancy

[30/06/2023 – 30/11/2024]

Expert contract EX2015D231704-104
Member of the CO_2 Monitoring Task Force
Assisting the European Commission with the design, implementation and evaluation of EU programmes for: CO_2 Monitoring Task Force, the development of a framework for an operational anthropogenic CO_2 emission monitoring and verification support capacity: phase IV

Co-authoring the policy brief on: "The use of prior information in the CAMS CO_2MVS capacity" https://publications.jrc.ec.europa.eu/repository/handle/JRC141365

Vrije Universiteit Amsterdam – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Senior Researcher

[02/04/2022 – 31/12/2023]

As part of the **CoCO$_2$** project - "Prototype system for a Copernicus CO_2 service" next to GHG synthesis publications, I was involved in the User Engagement work package dealing with compiling yearly budgets of CO_2 and CH_4 emissions from cities and compilation of a catalogue of published studies on hot spot detection (city estimates, gas leaks etc) part of the preparation of the implementation plan for adequate communication to societies seen as an educational link to fighting climate change.
https://coco2-project.eu/

As part of **AVENGERS**, the aim is to establish top-down techniques to support the verification of national greenhouse gas (GHG) inventories and other regulated estimates of emissions and removals, in order to improve or supplement the methods/approaches currently used.
My work focuses on the Reconciliation of top-down model results with bottom-up inventories and writing of good practice guidelines for supporting national inventories with top-down methods.
https://avengers-project.eu/

As part of the **VERIFY** project "Observation-based system for monitoring and verification of greenhouse gases" my work was dealing with reconciliation and assessment of different tools leading to verification of GHG inventories by synthesising observation-based estimates of GHG fluxes and carbon stocks from bottom-up state-of-the-art models, top-down (inversions) and global inventory emissions databases (e.g. EDGAR-JRC, FAOSTAT) to deliver products in preparation for comparison and potential reconciliation with official country level UNFCCC national GHG inventories.
https://verify.lsce.ipsl.fr/

European Commission, Joint Research Centre – Ispra, Italy

City: Ispra | **Country:** Italy

Expert contract - Consultancy

[28/10/2021 – 01/04/2022]

Expert contract CT-EX2015D231704-103
The work carried out falls under the H2020 VERIFY project, more particular on Work Package 6, which aims at designing the policy-relevant greenhouse gas (GHG) monitoring and verification system.
The work focuses on:
Online update of national emission inventory and observation-based GHG budget trends and NDC mitigation targets
This consists of a reconciliation of the observation-based budget trend and inventory trend within the trend uncertainty, allowing to track the real GHG mitigation achievements in view of the NDCs.
Online representation of the geographic distribution of GHG emissions and sinks uncertainties and how targeted new observations will help to reduce them.
This consists of a recommendation for uncertainty reduction of the emission inventory over EU.

Vrije Universiteit Amsterdam, Earth and Climate Cluster – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Researcher

[31/01/2018 – 29/09/2021]

As part of the **VERIFY** project "Observation-based system for monitoring and verification of greenhouse gases" my work was dealing with reconciliation and assessment of different tools leading to verification of GHG inventories by synthesising observation-based estimates of GHG fluxes and carbon stocks from bottom-up state-of-the-art models, top-down (inversions) and global inventory emissions databases (e.g. EDGAR-JRC, FAOSTAT) to deliver products in preparation for comparison and potential reconciliation with official country level UNFCCC national GHG inventories.
https://verify.lsce.ipsl.fr/

As part of the **CoCO$_2$** project - "Prototype system for a Copernicus CO_2 service" next to GHG synthesis publications, I was involved in the User Engagement work package dealing with compiling yearly budgets of CO_2 and CH_4 emissions from cities and compilation of a catalogue of published studies on hot spot detection (city estimates, gas leaks etc) part of the preparation of the implementation plan for adequate communication to societies seen as an educational link to fighting climate change.
https://coco2-project.eu/

Vrije Universiteit Amsterdam, IVM – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Project Coordinator - Amsterdam Water Science

[14/09/2015 – 27/02/2017]

- Research on two pilot projects funded by Amsterdam Water Science (AWS) (Dutch peatland restoration strategies under future land use changes (Commonland) and monitoring and assessment of greenhouse gas emissions (VU Amsterdam) from and around the greater Amsterdam area).
- Scientific editing, student supervision, presentation support, grant proposal writing.
- Project management – administrative and logistic activities, support to the AWS Steering Committee.
- Coordination of internal and external meetings, events and news, website development and maintenance.
- Integration of education and research with stakeholder participation.
- Writing publications and act as reviewer for several scientific journals.

European Commission, Joint Research Centre – Ispra, Italy

City: Ispra | **Country:** Italy

Expert contract - consultancy

[28/02/2015 – 29/06/2015]

Expert contract EX2015D231704

- Research on updating the EDGAR v4.3 with GFED4 data emissions on large scale biomass burning.
- Consultancy on FAOSTAT agriculture emissions data (crops, animals).

European Commission, Joint Research Centre – Ispra, Italy

City: Ispra | **Country:** Italy

Research collaboration

[30/06/2013 – 27/02/2015]

- Global data analysis and review (FLUXNET data).
- Writing scientific publication i.e. multi-site comparisons of northern wetland emissions under different land use scenarios (**Petrescu et al., 2015 PNAS**) with extensive collaborative research with the FLUXNET community research network.
- Global modelling of natural CH_4 emissions from wetlands for EDGAR database.

European Commission, Joint Research Centre – Ispra, Italy

City: Ispra | **Country:** Italy

Post-Doctoral Researcher (Grantholder 30)

[30/06/2010 – 29/06/2013]

- Support the Air and Climate Unit with research on emissions of greenhouse gases and air pollutants in the various world regions using the emission database EDGAR.
- Research on defining data needs and methodological aspects to calculate C stocks for the LULUCF sector.
- Updating the EFs and AD for the agricultural sector and performing updates on fire emission data.
- Calculation of present day emission inventories in the various world regions.
- Analyzing, processing and gridding of geographical and statistical data from regional to global scale making use of different land use and land cover maps, climate and weather datasets.
- Analyzing co-benefits of air-pollution and climate policies in Europe, neighboring countries and selected world regions.
- Global modelling of natural CH_4 emissions from wetlands for EDGAR database.
- Writing publications and act as reviewer for several scientific journals.

Vrije Universiteit Amsterdam – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Post-Doctoral Researcher

[28/02/2010 – 29/06/2010]

- Contribution to literature review and proposal writing for UNEP, UNEP/GPA, UNESCO "Global foundations for reducing nutrient enrichment and oxygen depletion from land based pollution in support of Global Nutrient Cycle".
- Drafting personal grant proposals (NWO Rubicon, WOTRO) and contributing to a scientific review paper on the nitrogen topic.

Vrije Universiteit Amsterdam – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Guest researcher

[31/08/2009 – 27/02/2010]

- Writing/submitting personal grant NWO Veni proposal on: "Isotopic composition of wetland CH_4 emission from the arctic to the tropics".

Vrije Universiteit Amsterdam – Amsterdam, Netherlands

City: Amsterdam | **Country:** Netherlands

Doctoral Researcher (Ph.D.)

[28/02/2006 – 30/08/2009]

- Doctoral dissertation: "Northern wetlands and their role in a changing climate: modelling CH_4 emissions in relation to hydrological processes".
- Upscaling CH_4 emissions from regional to global scale and calculations of wetland area changes using mapping procedures and analyzing different land cover and hydrological datasets.
- Consultancy work for an external project funded by the Dutch province of Drenthe aiming to assess CO_2 and CH_4 fluxes from wetland nature reserves in the Dutch province of Drenthe, using the PEATLAND-VU model and contribute to regional GHG assessment reports.

EURELECTRIC - Union of the electricity industry – Brussels, Belgium

City: Brussels | **Country:** Belgium

Research Assistant

[31/08/2005 – 27/02/2006]

- Research on good examples and sustainable energy practices and projects from European Union Member States
- Collection of data from members / national actors of Eurelectric.
- Calculations and statistical analysis of the results, presentation to customers (European Member States - stakeholders of Eurelectric Union)
- Participation in the workshops, stakeholder meetings.
- Drafting two environmental energy related reports (environmental and statistics)

European Commission DG Environment – Brussels, Belgium

City: Brussels | **Country:** Belgium

Research Assistant - LIFE Database (blue book stagiaire)

[28/02/2005 – 30/07/2005]

- Work with the LIFE Database.
- Overview of Natura 2000 sites for green and sustainable environmental projects.
- Contribution to EU publication and contribution to the drafting of the publication Focus "LIFE and European Forests" publication, 2006.

Hohenheim University – Stuttgart, Germany

City: Stuttgart | **Country:** Germany

Research Assistant

[31/03/2003 – 29/11/2003]

- Research assistant (hiwi-job) at the "University of Hohenheim", Soil Physics Institute performing measurements of N_2O and CH_4 emissions from the Black Forest slopes and tracer test experiments.

EDUCATION AND TRAINING

Doctoral research (Ph.D.)

Vrije Universiteit Amsterdam [02/2006 – 07/2009]

City: Amsterdam | **Country:** Netherlands

- Doctoral dissertation: "Northern wetlands and their role in a changing climate: modelling CH_4 emissions in relation to hydrological processes".
- Upscaling CH4 emissions from regional to global scale and calculations of wetland area changes using mapping procedures and analyzing different land cover and hydrological datasets.
- Consultancy work for an external project funded by the Dutch province of Drenthe aiming to assess CO_2 and CH_4 fluxes from wetland nature reserves in the Dutch province of Drenthe, using the PEATLAND-VU model and contribute to regional GHG assessment reports.

Master of Science (M.Sc.)

Hohenheim University [08/2002 – 09/2004]

City: Stuttgart | **Country:** Germany

- M.Sc. Program ENVIROFOOD "Environmental Protection and Agricultural Food Production" University of Hohenheim, Stuttgart, Germany.
- Graduate diploma in "Modelling N_2O emissions from a forest soil with the Wetland DNDC Model"

Diplomat Engineer (B.Sc.)

University Politehnica Bucharest [08/1997 – 05/2002]

City: Bucharest | **Country:** Romania

- Specialization in Environmental Engineering
- Diploma in Environmental Impact Assessment studies

Bacalaureat

Petru Rares Highschool [08/1993 – 06/1997]

City: Piatra Neamt | **Country:** Romania

Mathematics and Physics

LANGUAGE SKILLS

Mother tongue(s): Romanian

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C1

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

Italian

LISTENING C1 **READING** C1 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** C1

Dutch

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

SPOKEN PRODUCTION B1 **SPOKEN INTERACTION** B1

German

LISTENING B1 **READING** B1 **WRITING** A1

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

French

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

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

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

SKILLS

LinkedIn / Social Media / Zoom / Internet user / Gmail / WhatsApp / Teams

Research

Microsoft Office / Python Matplotlib / Microsoft Excel / Microsoft Powerpoint / Microsoft Word / GIS / Google Docs / P ower Point / Google Drive / Outlook / Analytical skills

Competences

Flexibility / Research and analytical skills / Team-work oriented / Creativity / Responsibility / Good listener and communicator / Written and Verbal skills / Motivated / Excellent writing and verbal communication skills / Decision-making / Organizational and planning skills / Strategic Planning

PUBLICATIONS

Publications First authored peer-reviewed:
A.M.R. Petrescu et al., 2024 https://essd.copernicus.org/preprints/essd-2023-516/A.M.R. Petrescu et al., 2023: https://essd.copernicus.org/articles/15/1197/2023/A.M.R. Petrescu et al., 2021 https://doi.org/10.5194/essd-13-2363-2021A.M.R. Petrescu et al., 2021 10.5194/essd-13-2307-2021A.M.R. Petrescu et al., 2020 "European anthropogenic AFOLU greenhouse gas emissions: A review and benchmark data" ESSD, 10.5194/essd-12-961-2020A.M.R. Petrescu et al. 2015 "The uncertain climate footprint of wetlands under human pressure", PNAS, doi: 10.1073/pnas.1416267112.A.M .R. Petrescu et al., 2012 "EDGARv4.3 - time series from 1990 to 2010", Biogeosciences, 9, 3437-3447, 2012.A.M.R. Petrescu et al., 2010: "Modeling regional to global CH4 emissions of boreal and arctic wetlands" Global Biogeochemical Cycles, GB4009, doi:10.1029/2009GB003610.J. van Huissteden, A.M.R. Petrescu, et al., 2009, "Sensitivity analysis of a wetland methane emission model based on temperate and arctic wetland sites", Biogeosciences, 6, 3035- 3051, 2009.A.M.R. Petrescu et al., 2009, "Assessing CH4 and CO2 emissions from wetlands in the Drenthe Province, The Netherlands: a modelling approach", The Netherlands Journal of Geosciences, Geologie en Mijnbouw, 88 (2), 101 – 116, 2009.A.M.R. Petrescu et al., 2008, "Modelling CH4 emissions from arctic wetlands: effects of hydrological parameterization", Biogeosciences, 5, 111-121.
Co-authored papers/books: Van der Gon et al., 2025: https://publications.jrc.ec.europa.eu/repository/handle/JRC141365Lauerwald et al., 2024: https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2024GB008141Tsurutra et al., 2024: https://egusphere.copernicus.org/preprints/2024/egusphere-2024-1953/McGrath et al., 2023: https://essd.copernicus.org/articles/15/4295/2023/Poulter et al., 2022: https://www.sciencedirect.com/science/article/abs/pii/B9780128149522000101?via%3DihubCiais et al., 2022: GMD, https://doi.org/10.5194/gmd-15-1289-2022.Deng et al. 2022: ESSD, https://essd.copernicus.org/articles/14/1639/2022/Qiu et al., 2021, Science Advances, DOI:10.1126/sciadv.abf1332Szenasi et al., 2021, Tellus B, DOI: 10.1080/16000889.2021.1914989Janssens-Maenhout, et al., 2019: "EDGAR v4.3.2 Global Atlas of the three major Greenhouse Gas Emissions for the period 1970–2012, ESSD, 10.5194/essd-11-959-2019Jan Willem Erisman et al., 2013, "Consequences of human modification of the global nitrogen cycle" Phil. Trans. R. Soc. B July 5, 2013 vol. 368 no. 1621; doi:10.1098/rstb.2013.0116, 1471- 2970.M. K. van der Molen et al., 2007 "The growing season greenhouse gas balance of a continental tundra site in the Indigirka lowlands, NE Siberia", Biogeosciences, 4, 985-1003, 2007.
Contribution to reports, book reviewF. de Vries, J.P. Lesschen, J. van den Akker, A.M.R. Petrescu, J. van Huissteden, I. van den Wyngaert, 2009, Bodemgerelateerde emissie van broeikasgassen in Drenthe, de huidige situatie, Alterra-report, 1859, ISSN 1566-7197. (5 citations)Janssens-Maenhout G., Petrescu A.M.R., Muntean M., Blujdea V., (2011). Verifying Greenhouse Gas Emissions: Methods to Support International Climate Agreements. GHG Measurement & Management, DOI: 10.1080/20430779.2011.579358. (19 citations)

CONFERENCES AND SEMINARS

Conferences Various presentations during the VERIFY, $CoCO_2$ and AVENGERS workshops and general assemblies.**IG^{3}IS and WMO 2023**: Talk on: User engagement in the $CoCO_2$ project**AGU 2020** *Invited speaker*: Session B067: Regional Budgets, Trends, and Drivers of Major Greenhouse Gases (N_2O, CH_4, and CO_2)**September 2020** 4th ICOS Science Conference talk:"A synthesis of European greenhouse gas emissions and their uncertainties"**Septembe r 2018** 3rd ICOS Science Conference talk: "Assessing the full greenhouse gas balance of EU countries and ecosystems: *a first look at different emission estimates and their uncertainties"***EGU 2012**: *Invited speaker*. Session BG2.2: Towards a full GHG balance from the biosphere. How important are N_2O and CH_4 emissions in different ecosystems? How difficult is to measure and to model their emission?Abstract title: Modelling regional to global CH_4 emissions of boreal and arctic wetlands.**AGU 2011**: *Poster*: Comparative analysis of major global forestry datasets for country level estimates of C stock changes in living biomass: *Comparison between IPCC 2003 and IPCC 2006 methodologies.***EGU 2008**: *Oral presentation* on Modelling CH_4 emissions: from a regional to a global arctic scale.**EGU 2007**: *Oral presentation* on Modelling methane emission from arctic wetlands.

PROJECTS

Projects

- Expert consultant profile for the European Commission EX2015D231704
- IM^{4}CA project: www.im4ca.eu
- Member of the UNU-Sustainability Nexus Analytics, Informatics, and Data (AID) Programme GHG module: https://www.sustainabilityaid.net/greenhousegasemissions
- AVENGERS project: https://avengers-project.eu/
- $CoCO_2$ project: https://coco2-project.eu/
- VERIFY project: https://verify.lsce.ipsl.fr/
- RECCAP2 project: https://climate.esa.int/en/projects/reccap-2/
- Amsterdam Water Science
- Marie Curie Fellow in GREENCYCLES RTN, FP6.
- Consultancy for external project funded by the Dutch Province of Drenthe.

JOB-RELATED SKILLS

Job-related skills

Flexible, multi-tasking, good at quickly picking up new insights and put them into practice, pragmatic and goal oriented, team player, dynamic and proactive.

Mapping, modelling, database management, editing and writing, data analysis and presentation skills:

- Applications: Python (Matplotlib module), ArcGIS, Microsoft OFFICE, MATLAB, SigmaPlot, R (basic user).
- Modelling: Bottom-up process based GHG emission models (e.g. PEATLAND-VU Model (van Huissteden et al., 2006), Wetland DNDC), sensitivity analysis (GLUE method).
- Websites: design, editing and management, Hippo CMS
- Operating systems Windows, UNIX (basics).
- Proficient in using and working with large environmental data sets, databases and reports (e.g. EDGAR, GFED, UNFCCC, IPCC, FAOSTAT, ECMWF, FAO/ISRIC, FRA, GLWD, Koppen-Geiger etc.).
- Research network contacts in The Netherlands (IVM, PBL, Utrecht University, Vrije Universiteit Amsterdam, Wetlands International) and international scientists of ECMWF, EC-JRC, FLUXNET, RECCAP, GEIA, GCP research networks projects and initiatives.
- Active reviewer for international peer-reviewed journals: ESSD, Nature Communications, Nature Geoscience, Biogeosciences, PLOS ONE.

ORGANISATIONAL SKILLS

Organisational skills

- Management and coordination of scientific syntheses review publications (40+ co-authors)
- Management of communication and dissemination activities
- Project coordination and management including planning, budgeting and supervision of MSc students.
- Organization and facilitation of meetings, workshops and conferences.
- Coordination of project activities, e.g. Amsterdam Water Science, Dutch scientific consortium with 110 researchers and with more than 50 international and Dutch collaborators (research institutes, governmental organizations, NGOs, companies and consultancies).

COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

- Good communication skills gained through working in many interdisciplinary teams.
- Good presentation skills gained through participation in conferences, workshops, seminars and project meetings.