Profile

As a physicist working on climate, I have long been convinced that climate change represents one of the most significant challenges humans have ever faced. I am also convinced we are utterly unprepared for it. For the last 20 years or so, I have worked on the interface between climate information and society with the aim of reducing barriers and facilitate the usability of the available knowledge. I believe that our ability to thrive, or even survive, in a warmer climate crucially depends on this.

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Carlo Buontempo

Director of Copernicus Climate Change Service at ECMWF

Education

2004 – PhD in Physics, University of L'Aquila, Italy
1998- BSC/MSC in Physics, University of Roma La Sapienza

Work experience

2019 -Deputy director of Copernicus Climate Change Service at ECMWF

2016-2019 Head of the Sectoral Information System of the Copernicus Climate Change Service at ECMWF

2011-2016 Manager of the climate adaptation team at Hadley Centre of the Met Office (UK)

2007-2011 Senior Scientist (Hadley Centre) Met Office (UK).

2007-2011Research Scientist Met Office (UK).

2005-2007 Post-Doc University of York (Canada).

Additional experience

Contributing author to the sixth assessment report of the IPCC WG1 Chapter 11

Chair of the Partner Advisory Committee of WMO's Global Framework on Climate Services

Member of the WMO Task Team on Climate Reanalyses. Ex-officio member of WCRP My Climate Risk

Member of the Scientific Advisory board for the Bjerknes Centre Climate Research in Norway and the climate Centre of Singapore.

Member of the editorial board of Journal of Climate Service

Brief bio

Since my BSC, I have been working on climate related topics covering aspects ranging from observations, data assimilation and modelling.

During my PhD I gained a first-hand experience in the challenges associated to development of a remote sensing instrument (Di Donfrancesco et al 2006) and in the processing of its outputs in the context of a numerical weather prediction model (Cairo et al. 2008). Both at university of York in Toronto Canada, where I did my post-doc, and later at the Met Office (UK), I worked with NWP models.
First on convective parameterisations and then on the operational assimilation of satellite data (Buontempo et al 2008).

Since 2007 I have been working in the field of climate services. Up until 2012, I was mostly focussing on the way of adapting the available tools to extract the information most relevant to end users. Such a general approach was applied to sectors as different as hydrology, energy, insurance, transport, global migration, health, or agriculture. In some cases, the focus was on processing existing datasets to inform the users (Hemming et al 2010), in other cases the effort was on the generation of the underpinning data (Buontempo et al. 2015).

In 2012, I became the scientific coordinator of EUPORIAS, an FP7 project of the European Commission. The main goal of the project was to find out how the climate information should best be transformed and processed to feed into specific decision-relevant contexts. With this project I had the chance to coordinate one of the first and major pan-European efforts to bring the scientific information about climate into real decision-making contexts in different sectors. The project was highly successful and had a broad impact on the European climate service landscape (Buontempo et al 2018, Falloon et al. 2018, Christel et al. 2018, Bedia et al. 2018, etc.).

In 2016, I moved to ECMWF to join the Copernicus Climate Change Service (C3S). My initial role was to lead on the development of sectoral applications (the so-called Sectoral Information System of C3S) which could inform decision in specific societal context. In such a role, I managed a budget of roughly 40 million euros providing scientific and technical leadership to many European contractors from research centres, national meteorological services, and private companies (Buontempo et al. 2020, Buontempo et al 2022, Yang et al. 2022, Cucchi et al. 2020, etc.).

In 2019, I became Director of the Copernicus Climate Change Service, a position I have held since then. One of my first tasks as director has been to define the scope of the second phase of C3S and negotiate the contract with the European Commission. Designing a 7-year programme spanning dataset ranging from historical observations to climate projection and keep it within predefined budget limits requires some hard choices. I decided to prioritise the continuity of the service and the operational implementation of climate reanalysis over the expansion of areas, such as for example, climate attribution, which would have required

significant additional funding. The negotiation took nearly a year but concluded well with the signature of a Contribution Agreement worth ~230 MEuros. Whilst my decisions meant having fewer novelties into the programme, the strategy I adopted ensured that key products (such as the back-extension of ERA5 to the 1940s and the ERA5t-Land) could be developed and made available to users.

In my current role I have four overarching tasks:
1) to provide scientific/technical leadership of a team of ~50 staff,
2) to execute the budget and coordinate the associated reporting towards the European Commission, 3) to ensure the timely production of all the operational outputs of the progamme and
4) to represent C3S internationally.

On top of these tasks, I also had the questionable honour to manage the team, and our many contractors, across a number of major institutional challenges and changes including:

- the global pandemic,
- the financial challenges associated to BREXIT,
- the relocation of the team to the EU, and
- the move of the operations from our headquarter in the UK to our new data centre in Bologna.

This left very little time to do much else but despite the constraints I managed to contribute to the science behind the service and kept publishing papers. For example I contributed to some of the most highly cited papers of C3S: in Bell et al. 2021, we described the back extension of ERA5 reanalyses to the 1950s (the paper describing to further back-extension to the 1940s is still under preparation); in Muñoz-Sabater et al. 2021 we described the ERA5-land Surface reanalyses. Whilst contributing to these high impact articles, my main scientific interest remained the interaction between climate data and societal use (O'Kane et al. 2023, Morin et al 2021, Street et al. 2019, Bruno Soares and Buontempo 2019, etc.).

In C3S, a significant effort has been dedicated to the interface with society. During my time as director I helped closing the gap between science and society through outreach activities and media events. Especially in the days following the publication of our reports (e.g. European State of the Climate, Monthly Bulletin) I typically engage with journalists from different countries (El Pais, The Guardian, Financial Time, La Repubblica, DW, CNN, BBC, Radio Rai, La Vanguardia, Le Monde, etc.) to present in plain language some of the key results and findings. Considering that the transition to a climate smart society goes through an enhanced ability to use the available knowledge and data, and this requires awareness of the available resources, I see these media outreach exercise as a fundamental part of my job.

Language skills

My mother tongue is Italian. My working language has been English for the last 20 years. My wife is Spanish, and we speak Catalan at home. I have given media interviews in English, Spanish, Italian and Catalan languages in which I read literature and regularly write emails. I have a school level of French that gives me the possibility of reading and understanding newspapers and radio programmes or having simple conversations. I do have an extremely

basic level of German. I am fascinated by languages and given enough time I would love to learn more.

Publications

I have listed here some of the most relevant publications. The full list can be obtained online.

Authors	Title	Journal	Issue	Vol	Pages	year
Buontempo et al.	The Copernicus climate change service: climate science in action	Bulletin of the American Meteorological Society	103	12	E2669 - E2687	2022
Buontempo et al.	What have we learnt from EUPORIAS climate service prototypes?	Climate Services	9		21-32	2018
Buontempo et al.	An ensemble climate projection for Africa	Climate dynamics	44		2097-2118	2015
Buontempo et al.	Climate service development, delivery and use in Europe at monthly to inter-annual timescales	Climate Risk Management	6		1-5	2014
Buontempo et al.	Fostering the development of climate services through Copernicus Climate Change Service (C3S) for agriculture applications	Weather and Climate Extremes	27		100226	2020
Pope et al.	Quantifying how user-interaction can modify the perception of the value of climate information: A Bayesian approach	Climate Services	6		41-47	2017
Cucchi et al.	WFDE5: bias-adjusted ERA5 reanalysis data for impact studies	Earth System Science Data	12	3	2097-2120	2020
Street et al.	How could climate services support disaster risk reduction in the 21st century	International journal of disaster risk reduction	34		28-33	2019
Bruno Soares and Buontempo	Challenges to the sustainability of climate services in Europe	Wiley Interdisciplinary Reviews: Climate Change	10	4	e587	2019
Bell et al.	The ERA5 global reanalysis: Preliminary extension to 1950	Quarterly Journal of the Royal Meteorological Society	147	741	4186-4227	2021
Muñoz-Sabater et al	ERA5-Land: A state-of-the-art global reanalysis dataset for land applications	Earth system science data	13	9	4349-4383	2021

My publications have 3252 citations (Google), I do have an overall H-Factor of 23 (according to Scopus) and 27 (according to Google Scholar) my I10-index is 40 (according to Google Scholar).