

**Director**  
**Argentinean National Meteorological Service**

**First Vice-President**  
**World Meteorological Organization**



**1 Personal Information: Name: Andrea Celeste Saulo**

Born in Buenos Aires, Argentina, May 6, 1964.

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**Hobbies and interests:** her favorite activities are playing tennis, cooking for her family and dancing Latin rhythms. In her youth, she used to play guitar. She is passionate about music in general and she prefers symphonic and Latin rock. She enjoys reading books on global history and culture, economics, politics and environmental issues. She is also fond of cinema.

**2 Profile**

Raised in a middle-class family, graduated with honors (Summa Cum Laude) from the University of Buenos Aires (UBA), married and mother of a son and a daughter, Professor Dr. Celeste Saulo pursued an unusual career in academia: she combined her calling for science and teaching with university management and the connection of scientific research with the needs of the society. Her vision on the co-production of knowledge, in articulation with productive sectors in order to strengthen the different components of the value creation cycle, led her to direct the National Meteorological Service of Argentina (SMN). From there, she promoted substantive organizational changes, based on a management that strives for concrete results, meets social demands, articulates at national, regional and international levels, and cultivates equity, inclusion and mutual respect. Her leadership is empathetic and motivating, she works tenaciously, with a great public service vocation, and she is passionate about meteorology and addressing the global challenges associated with climate change, natural hazards and the increasing vulnerability of peoples. These qualities enabled her to become 1st Vice-President of the World Meteorological Organization (WMO), being the first woman to occupy this position since the creation of the WMO.

**3 Academic background and professional career**

Prof. Celeste Saulo obtained her “Licenciatura” in Meteorology (Argentina degree equivalent to a Bachelor’s degree) from the University of Buenos Aires (UBA) in 1987. Later on, in 1996, she obtained her Ph.D. from the University of Buenos Aires in the area of Atmospheric Sciences. In 1988, she began her teaching career at the Department of Atmosphere and Ocean Sciences (DCAO, Spanish acronym) from the Faculty of Exact and Natural Sciences (FCEN, Spanish acronym) of the UBA, where she first served as Assistant Professor and then obtained, by competitive examination, the positions, with academic tenure, of Full-time Professor in 2006 and Associated Full-time Professor in 2017. Since 2002, she joined the CONICET (Spanish acronym for the National Council for Science and Technology) as a staff member of the Research Center for the Sea and the Atmosphere (Centro de Investigaciones del Mar y la Atmósfera, CIMA). Currently, she holds the position of Independent Researcher with place of work at the SMN. She has held visiting scientist positions at the University of Utah, USA, at the Climate Diagnostic Center from NOAA, USA, at the Weather and Climate Research Center (Centro de Previsão de Tempo e Estudos Climáticos - CPTEC, Portuguese acronym), Brazil, at the Federal University of Pelotas, Brazil and at the Laboratory of Dynamic Meteorology (Laboratoire de Météorologie Dynamique) of the École Normale Supérieure in Paris, France.

Her research focus on ensemble forecasting, short-to-medium range prediction and predictability, land-atmosphere interactions and the study of different components of the South America Monsoon System, including heavy precipitating systems, the South American low-level jet, the Northwestern Argentina low. She has been responsible for the group on Numerical Weather Prediction at CIMA since 1999, where most of the new techniques for atmospheric modeling and data assimilation have been used for improving short range forecasts over Southern South America. Her research has been key for better understanding the South American Monsoon System, and the associated patterns of precipitation and circulation during the warm season. In the last few years, she deepened her activity on interdisciplinary problems such as wind energy production, agricultural applications, and early warning systems. She has authored or co-authored more than 60 peer-reviewed scientific journal articles and book chapters. She supervised many students both at the undergraduate and graduate levels and, acting as Pi in 23 research projects financed by national and international agencies. Her vast teaching experience has been mainly related with numerical weather prediction, atmosphere dynamics and thermodynamics, mesoscale meteorology, cloud dynamics and cloud microphysics. Her courses were taught at the Department of Atmosphere and Ocean Sciences, FCEN-UBA, for graduate and undergraduate students.

From 2009 to 2013, she has been elected for two consecutive periods as the Director of the Department of Atmosphere and Ocean Sciences at the Faculty of Exact and Natural Sciences, University of Buenos Aires. In July 2014, Professor Celeste Saulo has been appointed as the Director of the Argentinean National Meteorological Service, and has been reappointed in July 2018. She has participated in several advisory committees and as a juror in the academic field.

In June 2015, Prof. Saulo has been elected as a member of the WMO Executive Council and served WMO since 2006 participating in different scientific panels. Until 2018, she was a member of the Scientific Steering Committee for the World Weather Research Program (WWRP). She has also been a member of the WGSIP (Working Group on Seasonal to Interannual Prediction) and of the WCRP/CLIVAR Panel for the Variability of the American Monsoon Systems (VAMOS).

In April 2018, she has been elected as Second Vice-president for WMO and, in June 2019, she was elected First Vice-President of said organization.

#### **4 Current Position:**

##### **In Argentina**

2014 to present: Director of the Argentinean National Meteorological Service.  
 2017 to present: Full-time Associated Professor with tenure (on leave).  
 2011 to present: 1<sup>st</sup> category researcher at the UBA.  
 2002 to present: CONICET Independent Researcher (on leave).

##### **International:**

2019 to present: 1st Vice-president of the WMO.  
 2014 to present: Permanent Representative for Argentina with the WMO.  
 2015 to present: Member of the WMO Executive Council (RA III).

#### **5. Previous positions:**

##### **In Argentina:**

2006 to 2017: Full-time Professor with tenure at DCAO (UBA).  
 2009 to 2013: Director of the Department of Atmosphere and Ocean Sciences (FCEN-UBA).  
 1992 to 2006: Full-time Assistant Professor - UBA.  
 1988 to 1992: Part-time Assistant Professor - UBA.

##### **International**

2019 to 2021: WMO – Research Board chair.  
 2018 to 2019: 2<sup>nd</sup> Vice-president of the WMO, acting as 1<sup>st</sup> VP.  
 2011 to 2018: Member of the World Weather Research Program Scientific Steering Committee  
 2008 to 2014: Member of the WGSIP/WCRP panel.

- 2008 to 2012: Associate Editor of the Brazilian Journal of Meteorology (Revista Brasileira de Meteorologia).
- 2006 to 2011: Member of the WCRP/CLIVAR Panel for the Variability of the American Monsoon Systems (VAMOS).

## 6. Awards

Gold Medal at the University of Buenos Aires, 1987.

CONICET Doctoral Scholarship (1987-1992).

CNPQ (National Council for Scientific and Technological Development), Brazil - Postdoctoral scholarship (1997).

Research scholarship at the University of Utah (2002).

"Recognition to women for their distinguished careers". Argentinean Professional Council of Economic Sciences. March 2020.

## 7. Direction, co-direction of researchers, graduate and undergraduate students:

**CONICET Researchers:** Pablo Spennemann, Paola Rodríguez Imazio.

Graduate students (under PhD scholarship programs): Santiago Moya, Florencia Lazzari.

### *Doctoral Thesis Students:*

- Topic: Effect of large wind turbines on the lower layers of the atmospheric flow. María Laura Mayol. Approved: March 2021.
- Topic: Simulation of the effect of the wind turbines interaction with the environment. Gonzalo Navarro. Approved: December 2019.
- Topic: Development of a stochastic-dynamic forecasting system for wind power based on the WRF/CIMA model. Cristian Waimann. Approved: August 2016.
- Topic: Study of the effects of different error sources upon the quality of analysis generated by a Kalman Filter data assimilation system. Marcos Saucedo. Approved: March 2016
- Topic: Study of soil moisture variability and its role in modulating evapotranspiration and precipitation over South America. Pablo Spennemann. Approved: March 2015
- Topic: An ensemble prediction system for short range weather forecasts over South America, Juan Ruiz. Approved: March 2009
- Topic: Origin and variability of the Northwestern Argentina Low and its impacts on regional circulation patterns, Lorena Ferreira. Approved: March 2008.

*Undergraduate thesis students (completed):* Maldonado, 2016; Schonholz, 2014; Aldeco, 2011; Waimann, 2011; Spennemann, 2010; Saunier, 2007; Ruiz, 2004; Ferreira 2002.

## 9 Publications:

Total: 3 book chapters, more than 60 national and international peers reviewed publications. Some selected publications:

1. Navarro Diaz, G. P., A. C. **Saulo**, A. D. Otero, 2021. Full wind rose wind farm simulation including wake and terrain effects for energy yield assessment, Energy, Volume 237, 121642, ISSN 0360-5442, <https://doi.org/10.1016/j.energy.2021.121642>.
2. Stephen W. Nesbitt, Paola V. Salio, (...others in alphabetical order...) A. Celeste **Saulo**, (...others...), 2021. A storm safari in Subtropical South America: RELAMPAGO project. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/BAMS-D-20-0029.1>

3. Varble, A. C., Nesbitt, (...others in alphabetical order...) Saulo, C., (...others...), 2021. Utilizing a Storm-Generating Hotspot to Study Convective Cloud Transitions: The CACTI Experiment, *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/BAMS-D-20-0030.1>
4. Gonzalo P. Navarro Diaz, M. L. Mayol, A. C. **Saulo**, A. D. Otero, 2020. Sensitivity of the wake effect to the stability of the atmospheric boundary layer in an on-shore wind farm in Patagonia, Argentina. *Meteorologica*, 31 p, en. DOI:10.24215/1850468Xe008
5. Maldonado, P., J. Ruiz, and C. **Saulo**, 2020: Parameter Sensitivity of the WRF–LETKF System for Assimilation of Radar Observations: Imperfect-Model Observing System Simulation Experiments. *Wea. Forecasting*, **35**, 1345–1362, <https://doi.org/10.1175/WAF-D19-0161.1>.
6. Ruti, P.M., (...others in alphabetical order...) A. Celeste **Saulo**, (...others...), 2020: Advancing Research for Seamless Earth System Prediction. *Bull. Amer. Meteor. Soc.*, 101, E23–E35, <https://doi.org/10.1175/BAMS-D-17-0302.1>
7. Gonzalo P. Navarro Diaz, A. C. **Saulo**, A. D. Otero, 2019. Wind farm interference and terrain interaction simulation by means of an adaptive actuator disc, *Journal of Wind Engineering and Industrial Aerodynamics*, Volume 186, 2019, Pages 58-67, ISSN 0167-6105, <https://doi.org/10.1016/j.jweia.2018.12.018>
8. Ruiz, J.; Aldeco, L.; Diehl, A.; García Skabar, Y.; Matsudo, C.; Osman, M.; Pelorosso, L.; **Saulo**, C.; Vera, C., 2018. Chapter 37: Applications in Argentina. "Physics of chaos in weather prediction". Santos Burguete, Carlos (ed.). Madrid: Agencia Estatal de Meteorología, 2018, p. 583-598. Book DOI: 10.31978/014-18-009-X. Chapter 37 DOI: 10.31978/014-18-009-X.37.
9. Tompkins, A., M. Ortiz de Zárate, R. Saurral, C. Vera, C. **Saulo**, W. Merryfield, M. Sigmund, W. Lee, J. Baehr, A. Braun, A. Butler, M. Déqué, F. Doblas-Reyes, M. Gordon, A. Scaife, Y. Imada, M. Ishii, T. Ose, B. Kirtman, A. Kumar, W. Müller, A. Pirani, T. Stockdale, M. Rixen, and T. Yasuda, 2017: The Climate-system Historical Forecast Project: providing open access to seasonal forecast ensembles from centers around the globe. *Bull. Amer. Meteor. Soc.* doi:10.1175/BAMS-D-16-0209.1.
10. Spennemann P. and **Saulo**, C., 2015. An estimation of the land-atmosphere coupling strength in South America using the Global Land Data Assimilation System. *Int. J of Climatology*, 16 pp. DOI: 10.1002/joc.4274.
11. Pablo Spennemann, Juan Rivera, Celeste **Saulo**, Olga Penalba, 2015. A comparison of GLDAS Soil Moisture anomalies and the Standardized Precipitation Index over South America. *J. of Hydrometeorology*, Vol 16, 158-171.
12. Marengo, Jose; Liebmann, Brant; Grimm, Alice; Misra, Vasubandhu; Silva Dias, Pedro; Cavalcanti, Iracema; Carvalho, Leila; Berbery, Ernesto; Ambrizzi, Tercio; Vera, Carolina; **Saulo**, Andrea Celeste; Nogue-Paegle, Julia; Zipser, Eduard; Seth, Anji; Alves, Lincoln, 2012. Recent developments on the South American Monsoon System. *Int. J. of Climatology*, doi: 10.1002/joc.225. Volume 32, Issue 1, January 2012, Pages: 1–21
13. Ruiz, J. and C. **Saulo**, 2011. How sensitive are probabilistic precipitation forecasts to the choice of calibration algorithms and the ensemble generation method? Part I: Sensitivity to calibration methods. *Meteorological Applications*, 1-12: DOI: 10.1002/met.286.
14. Ruiz, Juan J., Celeste **Saulo** and Julia Nogués-Paegle, 2010: WRF Model Sensitivity to Choice of Parameterization over South America: Validation against Surface Variables. *Mon. Wea. Rev.*, 138, 3342–3355. DOI: 10.1175/2010MWR3358.1

15. **Saulo**, Celeste, Lorena Ferreira, Julia Nogués-Paegle, Marcelo Seluchi, Juan Ruiz, 2010: Land–Atmosphere Interactions during a Northwestern Argentina Low Event. *Mon. Wea. Rev.*, 138, 2481–2498. DOI: 10.1175/2010MWR3227.1.
16. **Saulo**, C., J. Ruiz and Y. García Skabar, 2007. Synergism between the low level jet and organized convection at its exit region, *Monthly Weather Review*, Vol. 135, No. 4, 1310–1326.
17. Vera, C.; J. Baez; M. Douglas; C. B. Emmanuel; J. Marengo; J. Meitin; M. Nicolini; J. Nogués-Paegle; J. Paegle; O. Penalba; P. Salio; C. **Saulo**; M. A. Silva Dias; P. Silva Dias; and E. Zipser, 2006. –Authors in alphabetical order- The South American Low-Level Jet Experiment (SALLJEX). *Bull. Am. Met. Soc* , Vol. 87, No. 1, pp. 63–77.
18. Marengo, J., W. R. Soares, C. **Saulo** and M. Nicolini, 2004: Climatology of the Low-Level Jet East of the Andes as Derived from the NCEP–NCAR Reanalyses: Characteristics and Temporal Variability. *Journal of Climate*: Vol. 17, No. 12, pp. 2261–2280.
19. Seluchi, M., C. **Saulo**, M. Nicolini and P. Satyamurty, 2003. The Northwestern Argentinean Low: a study of two typical events, *Monthly Weather Review*, 131, Nro 10, 2361–2378
20. **Saulo**, C., M. Nicolini y Sin Chan Chou, 2000. Model characterization of the South American low-level flow during the 1997–1998 spring–summer season. *Climate Dynamics*, Volume 16, 867–881.