

Alexander E. “Sandy” MacDonald



Dr. Alexander E. (Sandy) MacDonald retired from over 40 years of federal service in the National Oceanic and Atmospheric Administration, on January 3, 2016. He was a Senior Executive since 1990 and President of the American Meteorological Society in 2015. He retired after 10 years as Director of NOAA's largest research laboratory, the Earth System Research Lab in Boulder, Colorado. He was Chief Science Advisor for NOAA's research line, and its Deputy Assistant Administrator from 2006 to 2012. He was Director of NOAA's Forecast Systems Laboratory from 1988 to 2005. He is the inventor of NOAA's Science On a Sphere, an educational exhibit now in over 130 museums worldwide. He worked with Vice President Al Gore to start the GLOBE Program in 1994. He is the recipient of four Presidential Rank Awards.

Dr. MacDonald recently published (January 25, 2016) an article in *Nature Climate Change*, titled **“Future cost-competitive electricity systems and their impact on US CO₂ emissions”** that was ranked in the 99th percentile of impact by *Altimetric*. The article presents results that show the US could reduce its carbon dioxide emissions by up to 80% by 2030, by implementing a High Voltage Direct Current transmission network. The article presents a solution to greenhouse gas emissions that could be implemented now with existing technology, and would be also be feasible in other major economies such as Europe, China and India.

On April 4, 2016 he joined Spire Global, where he is leading a group that is developing global weather models and advanced energy solutions.

Contact

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Curriculum Vitae

EDUCATION

Ph.D. in Meteorology (Minor in Computer Science), University of Utah, 1975

M.S. in Meteorology, University of Utah, 1973

B.S. in Mathematics/Physics, Montana State University, 1967

USAF Weather Course Certificate in Meteorology, St. Louis University, 1968

PROFESSIONAL EXPERIENCE

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|--------------------|---|
| 2006 - 2016 | Deputy Assistant Administrator, Laboratories and Cooperative Institutes, OAR
Director, Earth System Research Laboratory, NOAA |
| 1988 - 2006 | Director, Forecast Systems Laboratory, NOAA |
| 1983 - 1988 | Director of the Program for Regional Observing and Forecasting Services (PROFS), Environmental Research Laboratory (ERL), NOAA |
| 1980 - 1982 | Chief of PROFS, Exploratory Development Group, ERL, NOAA |
| 1975 - 1980 | Techniques Improvement Meteorologist in the Scientific Services Division, Western Region National Weather Service, NOAA in Salt Lake City |
| 1973 - 1975 | University of Utah - Research Fellowship |
| 1971 - 1973 | University of Utah - Instructor, Synoptic Meteorology Laboratory |
| 1967 - 1971 | Officer, U.S. Air Force |

MEMBERSHIP IN PROFESSIONAL SOCIETIES

President, American Meteorological Society, 2015

American Meteorological Society

National Weather Association

RESEARCH INTERESTS

Dr. MacDonald has published in atmospheric modeling, statistics, dynamics, and meteorological systems. His interests are applications of science and technology to improve operational forecasting.

ACTIVITIES

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| 2005 | Patent #6,937,210, "Projecting Images on a Sphere", Alexander E. MacDonald |
| 2002 | Patent #6,421,010, "Atmospheric Sondes and Method for Tracking", Russell B. Chadwick and Alexander E. MacDonald |
| 1994 | Executive Committee Member, AMS; AMS Fellow |
| 1993 | Developed GLOBE Program (a Vice-Presidential Initiative) |

- 1992** Councilor, AMS three-year appointment
- 1983 - Present** Lecturer at numerous AMS chapters throughout the United States.
- 1987 - Present** Member, AMS Committee on Aviation, Range, and Aerospace Meteorology
- 1984 - Present** Member, Panel on Mesoscale Research, NRC
- 1988 - Present** Fellow with the Cooperative Institute for Research in the Atmosphere - Colorado State University

AWARDS

- 2009** Presidential Rank Award - Distinguished
- 2007** Presidential Rank Award - Meritorious
- 2001** Presidential Rank Award - Meritorious
- 1997** Presidential Rank Award - Distinguished
- 1993** Gold Medal - Leadership in Technology Transfer
- 1980** Bronze Medal - Accomplishments in NWS AFOS Program