# Altuğ Aksoy

**Scientist (University of Miami)**

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| **Current Affiliation:** | Cooperative Institute for Marine and Atmospheric Studies,<br>Rosenstiel School of Marine, Atmospheric, and Earth Science,<br>University of Miami, Miami, Florida<br>*-and-*<br>Hurricane Research Division,<br>Atlantic Oceanographic and Meteorological Laboratory,<br>National Oceanic and Atmospheric Administration, Miami, Florida |
| **Work Address:** | Hurricane Research Division, NOAA/AOML<br>4301 Rickenbacker Causeway<br>Miami, FL 33149 |
| **E-Mail:** | aaksoy@miami.edu, altug.aksoy@noaa.gov |
| **Webpage:** | https://www.aoml.noaa.gov/people/altug-aksoy |


## Academic Background

- **Ph.D. in Atmospheric Sciences –** August 2005
  Department of Atmospheric Sciences, *Texas A&M University*
  College Station, Texas
  Dissertation Title: Mesoscale Ensemble-Based Data Assimilation and Parameter Estimation
  Advisors: Dr. Fuqing Zhang and Dr. John W. Nielsen-Gammon
- **M.B.A., Finance and Investments –** January 1994
  School of Business and Public Management, *The George Washington University*
  Washington, DC
- **B.S. in Mechanical Engineering –** July 1991
  Department of Mechanical Engineering, *Boğaziçi University*
  Istanbul, Turkey
  Concentration: Materials and machine design

## Current Research Interests and Activities

- Ensemble-based data assimilation & Ensemble Kalman filter techniques
- Hurricane data assimilation and modeling
- Radar data assimilation
- Simultaneous state and parameter estimation
- Ensemble forecasting and model development
- Hurricanes and tropical meteorology
- Chaos theory and predictability studies

## Research Products and Software Development

- **Hurricane Ensemble Data Assimilation System (HEDAS) at *NOAA/AOML*, 2008-present:** A state-of-the-art, high-performance computing system to incorporate, in real time, high-resolution aircraft observations of tropical cyclones into numerical weather prediction models. Not only has this system provided the capability to obtain a more complete picture of the three-dimensional structure of tropical cyclones using in-situ aircraft observations, but it is also used to demonstrate the value of such observations for numerical models by improving their forecast skill in predicting tropical cyclone intensity.
- **NOAA/AOML/HRD HRDOBS Dataset, 2024-present:** A comprehensive dataset that includes all tropical cyclone inner-core observations in a uniform format with appropriate error estimations. The dataset brings together observations from various platforms that generate data at different resolutions and are ultimately stored at disparate locations online.
- Logistic Map Simulator (Open-Source Software), 2025–Present: An interactive Python/Streamlit application designed to visualize the limits of predictability in chaotic systems. It serves as the digital companion to the research published in *Chaos* (2024), allowing users to run real-time ensemble simulations and visualize error growth (the "Butterfly Effect") via high-resolution bifurcation density plots.
    - URL: Streamlit App Link | GitHub: Open-source code link
- **Online Quality Control Technique for Ensemble-Based Data Assimilation Applications, 2022-present:** An advanced technique that is based on observation innovations normalized by total uncertainty, which is composed of observation error and observation-space ensemble variance. Combined with a nonparametric outlier identification mechanism, this technique can identify outlier observations effectively even in highly non-Gaussian observation innovation distributions typically found in the tropical cyclone inner-core region and has been shown to result in improved analyses in these situations.
- **Storm-Relative Hurricane Observation Processing Technique at *NOAA/AOML*, 2013-present:** An advanced observation processing technique for hurricane data assimilation applications that accounts for storm motion within a given processing window and allows for homogeneous distribution of observations throughout the assimilation cycles within. This technique is now routinely used in HEDAS when sufficient vortex center data are presented in each processing window.
- **Pioneering scientist in atmospheric parameter estimation**: Since his Ph.D. work at *Texas A&M University*, demonstrated and advocated the utilization of meteorological observations in data assimilation systems to estimate and improve key internal features of numerical weather prediction models. He is also the author of the chapter titled "Parameter Estimation" in *Encyclopedia of Atmospheric Sciences, 2nd/3rd Editions*.
- **Idealized, non-linear numerical sea breeze model at *Texas A&M University*, 2003-2005:** This model has been used to demonstrate the value of ensemble-based data assimilation in thermally forced circulations and later coupled with a chemical tracer model to evaluate how meteorological observations can be utilized to better model the transport of ozone in a sea breeze environment.

## Research and Teaching Experience

▸ **Scientist –** June 2017 – Present
CIMAS, *University of Miami* & NOAA/AOML/HRD
Miami, Florida

▸ **Associate Scientist –** February 2013 – May 2017
CIMAS, *University of Miami* & NOAA/AOML/HRD
Miami, Florida

▸ **Assistant Scientist –** July 2009 – January 2013
CIMAS, *University of Miami* & NOAA/AOML/HRD
Miami, Florida

▸ **Postdoctoral Associate –** July 2008 – July 2009
CIMAS, *University of Miami* & NOAA/AOML/HRD
Miami, Florida

▸ **Postdoctoral Fellow –** October 2005 – July 2008
Mesoscale and Microscale Meteorology Division (MMM) and
Institute for Mathematics Applied to Geosciences (IMAGe)
*The National Center for Atmospheric Research*
Boulder, Colorado

▸ **Research and Teaching Assistant –** Spring 2001 – Summer 2005
Department of Atmospheric Sciences, *Texas A&M University*
College Station, Texas

▸ **Instructor –** Fall 2002
Department of Atmospheric Sciences, *Texas A&M University*
College Station, Texas

## Leadership and Service

▸ **Lead Project Scientist –** 2014 – 2017
*NOAA Gulfstream IV Aircraft Hurricane Reconnaissance Missions*
Hurricane Research Division, AOML/NOAA

▸ **Principal Investigator –** 2014 – Present
*NOAA Hurricane Field Program*
Hurricane Research Division, AOML/NOAA

▸ **Editor –** November 2013 – December 2020
*Monthly Weather Review*, American Meteorological Society

▸ **Associate Editor –** January 2009 – November 2013; January 2021 – Present
*Monthly Weather Review*, American Meteorological Society

▸ **Peer Reviewer on Scientific Journals –** 2006 – Present
*Nature Communications, Bulletin of the American Meteorological Society, Journal of the Atmospheric Sciences, Monthly Weather Review, Journal of Climate, Earth Interactions, Journal of Applied Meteorology and Climatology, Weather and Forecasting, Journal of Geophysical Research, Geophysical Research Letters, Quarterly Journal of the Royal Meteorological Society, Tellus, Stochastic Environmental Research and Risk Assessment*

▸ **Peer Reviewer for Grant Proposals –** 2012 – Present
*Various NOAA National Weather Service Grant Applications*
*Various National Science Foundation (NSF) Grant Proposal Submissions*
*Panelist, NASA's 2011 ROSES A33 solicitation for Earth Sciences Applications on Disasters*

▸ **Session Chair**

[1] May 2021: *Data Assimilation and Observing Strategies II,* 34th Conference on Hurricanes and Tropical Meteorology, Held Virtually.

[2] April 2018: *DA and Observing Systems III*, 33rd Conference on Hurricanes and Tropical Meteorology, Ponte Vedra, Florida.

[3] January 2017: *Data Assimilation: Satellites and Radar*, 21st Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface, Seattle, Washington.

[4] April 2016: *Data Assimilation and Observing Systems III,* 32nd Conference on Hurricanes and Tropical Meteorology, San Juan, Puerto Rico.

▸ **Co-Organizer of the NOAA HFIP Observations Workshop –** May 2011
*Atlantic Oceanographic and Meteorological Laboratory, NOAA*
Miami, Florida

▸ **Adviser for National Research Council –** 2013 – Present
*Research Associateship Program*
*Postdoctoral Fellowship Opportunity at NOAA/AOML* – Miami, Florida
Postdoctoral Associates Advised: Jonathan Poterjoy (March 2017-2019)

▸ **Adviser for NOAA Hollings Scholarship Program –** 2013 – Present
*NOAA Office of Education Undergraduate Scholarship Program*
*Internship Opportunity at NOAA/AOML* – Miami, Florida
Hollings Scholars Advised: Robert Nystrom (2014), Rani Wiggins (2017)

▸ **Mentor for Rosenstiel School/CIMAS Mentoring Program –** Aug 2021 – Present
Provided mentorship for the following CIMAS employees: Lakemariam Worku (2021-2022), Stephanie Rosales (2022-2023), Richard Karp (2024-2025)

# Publications

## ▸ Refereed Journal Articles

[1] **Aksoy, A.**, 2024: A Monte Carlo approach to understanding the impacts of initial-condition uncertainty, model uncertainty, and simulation variability on the predictability of chaotic systems: Perspectives from the one-dimensional logistic map. *Chaos*, **34**, 011102, https://doi.org/10.1063/5.0181705. (Also see Logistic Map Simulator in Research Products.)

[2] Sellwood, K. J., J. A. Sippel, and **A. Aksoy**, 2023: Assimilation of Coyote Small Uncrewed Aircraft System Observations in Hurricane Maria (2017) using Operational HWRF. *Weather and Forecasting*, **38**, 901–919, https://doi.org/10.1175/WAF-D-22-0214.1.

[3] **Aksoy, A.**, J. J. Cione, B. A. Dahl, and P. D. Reasor, 2022: Tropical cyclone data assimilation with Coyote Uncrewed Aircraft System observations, very frequent cycling, and a new online quality control technique. *Monthly Weather Review*, **150**, 797-820, https://doi.org/10.1175/MWR-D-21-0124.1.

[4] Christophersen, H., J. Sippel, **A. Aksoy**, and N. L. Baker, 2022: Recent advancements for tropical cyclone data assimilation. *Ann NY Acad Sci.*, 1–19, https://doi.org/10.1111/nyas.14873.

[5] Zawislak, J., R. F. Rogers, S. D. Aberson, G. J. Alaka, G. Alvey, **A. Aksoy**, et al., 2022: Accomplishments of NOAA'S airborne hurricane field program and a broader future approach to forecast improvement. *Bulletin of the American Meteorological Society*, **103**, E311-338, https://doi.org/10.1175/BAMS-D-20-0174.1.

[6] Schultz, D. M., **A. Aksoy**, J. Anderson, et al., 2020: Data availability principles and practice. *Monthly Weather Review*, **148**, 4701-4702, https://doi.org/10.1175/MWR-D-20-0323.1.

[7] Wick, G. A., J. P. Dunion, P. G. Black, J. R. Walker, R. D. Torn, A. C. Kren, **A. Aksoy**, et al., 2020: NOAA'S Sensing Hazards with Operational Unmanned Technology (SHOUT) Experiment: Observations and forecast impacts. *Bulletin of the American Meteorological Society*, **101**, E968–E987, https://doi.org/10.1175/BAMS-D-18-0257.1.

[8] Cione, J. J., G. H. Bryan, R. Dobosy, J. A. Zhang, G. de Boer, **A. Aksoy**, et al., 2020: Eye of the storm: Observing hurricanes with a Small Unmanned Aircraft System. *Bulletin of the American Meteorological Society*, **101**, E186–E205, https://doi.org/10.1175/BAMS-D-19-0169.1.

[9] Steward, J., J. E Roman, A. L. Daviña, and **A. Aksoy**, 2018: Parallel direct solution of the covariance-localized ensemble square root Kalman filter equations with matrix functions. *Monthly Weather Review*, **146**, 2819-2836.

[10] Christophersen, H., **A. Aksoy**, J. Dunion, and S. Aberson, 2018: Composite impact of Global Hawk unmanned aircraft dropwindsondes on tropical cyclone analyses and forecasts. *Monthly Weather Review*, **146**, 2297-2314.

[11] Christophersen, H., R. Atlas, **A. Aksoy**, and J. Dunion, 2018: Combined use of satellite observations and Global Hawk unmanned aircraft dropwindsondes for improved tropical cyclone analyses and forecasts. *Weather and Forecasting*, **33**, 1021–1031.

[12] Steward, J., **A. Aksoy**, and Z. Haddad, 2017: Parallel direct solution of the ensemble square-Root Kalman filter equations with observation principal components. *J. Atmos. Oceanic Technology*, **34**, 1867-1884.

[13] **Aksoy, A.**, J. A. Zhang, B. W. Klotz, E. W. Uhlhorn, and J. J. Cione, 2017: Axisymmetric initialization of the atmosphere and ocean for idealized coupled hurricane simulations, *J. Advances in Modeling Earth Systems*, doi:10.1002/2017MS000977.

[14] Christophersen, H., **A. Aksoy**, J. Dunion, and K. Sellwood, 2017: The impact of NASA Global Hawk unmanned aircraft dropwindsonde observations on tropical cyclone track, intensity, and structure: Case studies. *Monthly Weather Review*, **145**, 1817-1830.

[15] Aberson, S. D., **A. Aksoy**, K. J. Sellwood, T. Vukicevic, and X. Zhang, 2015: Assimilation of high-resolution tropical cyclone observations with an ensemble Kalman filter using HEDAS: Evaluation of 2008–11 HWRF forecasts. *Monthly Weather Review*, **143**, 511-523.

[16] Vukicevic, T.**, A. Aksoy**, P. Reasor, S. D. Aberson, K. J. Sellwood, and F. Marks, 2013: Joint impact of forecast tendency and state error biases in ensemble Kalman filter data assimilation of inner-core tropical cyclone observations. *Monthly Weather Review*, **141**, 2992-3006.

[17] Lorsolo, S., J. Gamache, and **A. Aksoy**, 2013: Evaluation of the Hurricane Research Division radar analysis software using synthetic data. *J. Atmos. Oceanic Technol.*, **30**, 1055-1071.

[18] **Aksoy, A.,** S. D. Aberson, T. Vukicevic, K. J. Sellwood, S. Lorsolo, and X. Zhang, 2013: Assimilation of high-resolution tropical cyclone observations with an ensemble Kalman filter using NOAA/AOML/HRD's HEDAS: Evaluation of the 2008-2011 vortex-scale analyses. *Monthly Weather Review*, **141**, 1842-1865.

[19] Rogers, R., S. Aberson, **A. Aksoy**, and Co-Authors, 2013: NOAA's Hurricane Intensity Forecasting Experiment (IFEX): A Progress Report. *Bull. Amer. Meteor. Soc.*, **94**, 859-882.

[20] **Aksoy, A.**, 2013: Storm-Relative Observations in Tropical Cyclone Data Assimilation with an Ensemble Kalman Filter. *Monthly Weather Review*, **141**, 506-522.

[21] **Aksoy, A.**, S. Lorsolo, T. Vukicevic, K. J. Sellwood, S. D. Aberson, and F. Zhang, 2012: The HWRF Hurricane Ensemble Data Assimilation System (HEDAS) for high-resolution data: The impact of airborne Doppler radar observations in an OSSE. *Monthly Weather Review*, **140**, 1843-1862.

[22] Lorsolo, S. and **A. Aksoy**, 2012: Wavenumber analysis of azimuthally distributed data: Assessing maximum allowable gap size. *Monthly Weather Review*, **140**, 1945-1956.

[23] **Aksoy, A.**, D. C. Dowell, and C. Snyder, 2010: A multi-case comparative assessment of the ensemble Kalman filter for assimilation of radar observations. Part II: Short-range ensemble forecasts. *Monthly Weather Review*, **138**, 1273-1292.

[24] **Aksoy, A.**, D. C. Dowell, and C. Snyder, 2009: A multi-case comparative assessment of the ensemble Kalman filter for assimilation of radar observations. Part I: Storm-scale analyses. *Monthly Weather Review*, **137**, 1805-1824.

[25] Stuart, A. L., **A. Aksoy**, F. Zhang, and J. W. Nielsen-Gammon, 2007: Ensemble-based data assimilation and targeted observation of a chemical tracer in a sea breeze model. *Atmospheric Environment*, **41**, 3082-3094.

[26] Zhang, F., N. Bei, J. W. Nielsen-Gammon, L. Guohoi, R. Zhang, A. Stuart, and **A. Aksoy**, 2007: Impacts of meteorological uncertainties on ozone pollution predictability estimated through meteorological and photochemical ensemble forecasts. *Journal of Geophysical Research*, **112**, D04304.

[27] **Aksoy, A.**, F. Zhang, and J. W. Nielsen-Gammon, 2006: Ensemble-based state and parameter estimation in a two-dimensional sea-breeze model. *Monthly Weather Review*, **134**, 2951-2970.

[28] **Aksoy, A.**, F. Zhang, and J. W. Nielsen-Gammon, 2006: Ensemble-based simultaneous state and parameter estimation with MM5. *Geophysical Research Letters*, **33**, L12801.

[29] Zhang, F., Z. Meng, and **A. Aksoy**, 2006: Tests of an ensemble Kalman filter for mesoscale and regional-scale data assimilation. Part I: Perfect model experiments *Monthly Weather Review*, **134**, 722-736.

[30] **Aksoy, A.**, F. Zhang, J. W. Nielsen-Gammon, and C. C. Epifanio, 2005: Ensemble-based data assimilation for thermally forced circulations. *Journal of Geophysical Research*, **110**, D16105.

### ▸ Book Chapters

[1] **Aksoy, A.** and D. Wu, 2024: Parameter Estimation. Encyclopedia of Atmospheric Sciences. 3rd edition. W. A. Robinson, Ping Yang, Eds., Elsevier, https://doi.org/10.1016/B978-0-323-96026-7.00040-0.

## Recent Presentations and Seminars

[1] **Aksoy, A.**, 2023: Recent Tropical Cyclone Data Assimilation Research at NOAA/AOML Hurricane Research Division and University of Miami/CIMAS. Invited seminar at Penn State Department of Meteorology and Atmospheric Science Colloquium, 13 April 2023, College Park, Maryland.

[2] **Aksoy, A.**, 2023: Recent Tropical Cyclone Data Assimilation Research at NOAA/AOML Hurricane Research Division and University of Miami/CIMAS. Invited seminar at NOAA Environmental Modeling Center, 26 April 2023, State College, Pennsylvania.

[3] **Aksoy, A.**, J. J. Cione, B. A. Dahl, and K. Sellwood, 2021: Tropical Cyclone Data Assimilation with Coyote Uncrewed Aircraft System Observations, Very Frequent Cycling, and A New Online Quality Control Technique. The 34th Conference on Hurricanes and Tropical Meteorology, May 2021, Held Virtually, American Meteorological Society.

[4] **Aksoy, A.**, 2018: Tropical Cyclone Data Assimilation: Challenges and Recent Advances. JCSDA Summer Colloquium on Satellite Data Assimilation, 22 Jul-3 Aug 2018, Bozeman, Montana.

[5] **Aksoy, A.**, and Co-Authors, 2018: A Data Impact Study Using Coyote UAS Observations in Hurricane Maria (2017): Preliminary Look at Storm-Scale Analyses. The 33rd Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra, Florida, American Meteorological Society.

[6] **Aksoy, A.**, J. J. Cione, B. Dahl, K. Ryan, H. Christophersen, and R. Atlas, 2017: Evaluating the Impact of Hurricane Observations from the Unmanned Coyote Aircraft in Observing System Simulation Experiments. The 21st Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface, January 2017, Seattle, Washington, American Meteorological Society.

[7] **Aksoy, A.**, H. Christophersen, B. Dahl, K. J. Sellwood, and S. D. Aberson, 2017: Advances in Tropical Cyclone Vortex-Scale Data Assimilation using NOAA's Hurricane Ensemble Data Assimilation System (HEDAS) and Hurricane WRF (HWRF) Model. The Third Symposium on High Performance Computing for Weather, Water, and Climate, January 2017, Seattle, Washington, American Meteorological Society.

[8] **Aksoy, A.**, 2016: An Overview of the Tropical Cyclone Data Assimilation Activities at NOAA's Hurricane Research Division. The 7th EnKF Data Assimilation Workshop, 23-27 May 2016, State College, Pennsylvania.

[9] **Aksoy, A.**, J. Cione, H. Christophersen, B. Dahl, and K. Ryan, 2016: Utilizing the Coyote UAS/UASonde Observations to Improve Tropical Cyclone Data Assimilation and Prediction. Coyote UAS Summit 2016, 11-12 May 2016, Boulder, Colorado.

[10] **Aksoy, A.**, J. Cione, H. Christophersen, and B. Dahl, 2016: Assessing the Value of the Coyote UAS Platform and Observations from the Perspective of Tropical Cyclone Data Assimilation and Prediction. The 32nd Conference on Hurricanes and Tropical Meteorology, April 2016, San Juan, Puerto Rico, American Meteorological Society.

[11] **Aksoy, A.**, J. Cione, H. Christophersen, B. Dahl, B. Annane, L. Bucci, and R. Atlas, 2016: A First Look at the Impact of Coyote UAS Observations in Hurricane Edouard (2014) on Tropical Cyclone Data Assimilation and Prediction. The 20th Conference on Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface, January 2016, New Orleans, Louisiana, American Meteorological Society.

[12] **Aksoy, A.**, B. Klotz, J. Zhang, E. Uhlhorn, J. Cione, 2014: Model Sensitivity in Idealized, Ocean-Coupled Hurricane Simulations: Perturbations of Environment, Structure, and Model Physics Parameters. The 31st Conference on Hurricanes and Tropical Meteorology, April 2014, San Diego, California, American Meteorological Society.

[13] **Aksoy, A.**, 2013: Vortex-Scale Data Assimilation with HEDAS in the 2013 Season and Impacts of Parameter Perturbations. NOAA Hurricane Forecast Improvement Project Biweekly Teleconference, December 2013, Miami, Florida.

[14] **Aksoy, A.**, J. Zhang, B. Klotz, E. Uhlhorn, and J. Cione, 2013: Parameter Sensitivity for Idealized Coupled HWRF Simulations in a Sheared Environment. NOAA Hurricane Forecast Improvement Project Annual Review, June 2013, Miami, Florida.

[15] **Aksoy, A.**, T. Vukicevic, J. D. Whitaker, S. G. Gopalakrishnan, and S. D. Aberson, 2012: Recent Advances in vortex-scale data assimilation using NOAA/AOML/HRD's HWRF Ensemble Data Assimilation System (HEDAS). The 30th Conference on Hurricanes and

Tropical Meteorology, April 2012, Ponte Vedra Beach, Florida, American Meteorological Society.

[16] **Aksoy, A.**, 2012: Assimilation of high-resolution hurricane inner-core data with the HWRF Hurricane Ensemble Data Assimilation System (HEDAS): Evaluation of the 2008-2011 vortex-scale analyses. National Hurricane Center Seminar, February 2012, Miami, Florida.

[17] **Aksoy, A.**, S. Lorsolo, T. Vukicevic, K. Sellwood, and S. Aberson, 2011: NOAA/AOML/HRD's Hurricane Ensemble Data Assimilation System (HEDAS): A baseline study using simulated Doppler radar observations from Hurricane Paloma (2008). The 15th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans and Land Surface, January 2011, Seattle, Washington, American Meteorological Society.

[18] **Aksoy, A.**, 2011: Advances in ensemble-based mesoscale data assimilation: Recent findings from real-data experiments with tropical cyclones and midlatitude convective storms. Istanbul Technical University Department of Meteorological Engineering Seminar, December 2010, Istanbul, Turkey.

[19] **Aksoy, A.**, T. Vukicevic, J. D. Whitaker, S. G. Gopalakrishnan, and S. D. Aberson, 2010: Vortex-scale hurricane data assimilation: Real-data results using combined NOAA/AOML/HRD HWRF-X regional and NOAA/ESRL GFS global ensemble Kalman filter systems. The 29th Conference on Hurricanes and Tropical Meteorology, May 2010, Tuscon, Arizona, American Meteorological Society.

[20] **Aksoy, A.**, 2010: Vortex-scale hurricane data assimilation: Preliminary real-data results using NOAA/AOML/HRD's HWRF Ensemble Data Assimilation System (HEDAS). NOAA/AOML/HRD Internal Research Report, May 2010, Miami, Florida.

[21] **Aksoy, A.**, T. Vukicevic, K. J. Sellwood, S. Lorsolo, S. G. Gopalakrishnan, J. Zhang, S. Aberson, and F. Zhang, 2010: Vortex-scale hurricane data assimilation: OSSE results with airborne Doppler radar and dropsondes using NOAA/AOML/HRD's HWRF Ensemble Data Assimilation System (HEDAS) The 4th Ensemble Kalman Filter Workshop, April 2010, Albany, New York.

[22] **Aksoy, A.**, 2010: Vortex-scale hurricane data assimilation: Preliminary results with airborne Doppler radar and dropsondes using NOAA/AOML/HRD's HWRF Ensemble Data Assimilation System (HEDAS). NWS/NCEP Environmental Modeling Center Seminar, March 2010, Washington, DC.

[23] **Aksoy, A.**, T. Vukicevic, S. Lorsolo, K. J. Sellwood, and S. Aberson, 2010: The ensemble Kalman filter system for hurricane data assimilation at NOAA/AOML/HRD: Preliminary evaluation of simulated dropwindsonde and radar Doppler observations. The 14th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface, January 2010, Atlanta, Georgia, American Meteorological Society.

## External Funding Support

**Funding Agency:** NOAA Weather Program Office
**Period:** 08/01/2023 – 07/31/2026
**Award Amount:** $480,180 (two years)
**Role:** PI
**Title:** Building a Comprehensive Capability in Operational HAFS to Assimilate All Available Tropical Cyclone Inner-Core Observations

**Funding Agency:** NOAA Joint Technology Transfer Initiative
**Period:** 09/01/2022 – 10/31/2025
**Award Amount:** $237,056 (three years)
**Role:** PI
**Title:** Integration of a Fully Functional Atmospheric UFS-HASFS into JEDI with Weakly Coupled Ocean Data Assimilation Capability

**Funding Agency:** NOAA Office of Oceanic & Atmospheric Research
**Period:** 08/01/2014 – 07/31/2017
**Award Amount:** $1,249,008 (three years)
**Role:** Co-PI
**Title:** Using NOAA UAS Assets and OSSE/DA Capabilities to Improve Sampling Strategies and Numerical Prediction of Tropical Cyclone Track, Intensity, and Structure

**Funding Agency:** NOAA Office of Oceanic & Atmospheric Research
**Period:** 06/01/2021 – 05/31/2024
**Award Amount:** $2,129,315 (three years)
**Role:** Co-I
**Title:** Transitioning the Tropical Cyclone Air-Deployed sUAS CONOP to Operations

**Funding Agency:** NOAA Office of Oceanic & Atmospheric Research
**Period:** 06/01/2020 – 05/31/2023
**Award Amount:** $434,675 (three years)
**Role:** Co-I
**Title:** Using Small Unmanned Aircraft System Observations in Operational Data Assimilation to Improve Forecasts of Tropical Cyclone Track, Intensity, and Structure

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| **Funding Agency:** | NOAA Special Oceanic and Atmospheric Projects |
| **Period:** | 07/01/2020 – 08/31/2023 |
| **Award Amount:** | $500,000 (two years, extended) |
| **Role:** | PI |
| **Title:** | Accelerate the development of the Hurricane Analysis and Forecasting System (HAFS) |

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| **Funding Agency:** | NOAA Office of Oceanic & Atmospheric Research |
| **Period:** | 10/02/2013 – 09/30/2015 |
| **Award Amount:** | $1,027,950 |
| **Role:** | Co-I |
| **Title:** | Services to support the Hurricane Forecast Improvement Project |

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| **Funding Agency:** | NOAA National Weather Service |
| **Period:** | 01/01/2012 – 12/31/2014 |
| **Award Amount:** | $213,386 (two years with one-year no-cost extension) |
| **Role:** | PI |
| **Title:** | Investigation of HWRF model error associated with surface-layer and boundary-layer parameterizations to improve vortex-scale, ensemble-based data assimilation using HEDAS |

## Honors, Recognitions, and Affiliations

- **Full Membership**, *Sigma Xi, The Scientific Research Honor Society* (2026 – present)
- **Full Membership**, *American Geophysical Union* (2006 – present)
- **Full Membership**, *American Meteorological Society* (1998 – present)
- **Full Membership**, *The George Washington University M.B.A. Association* (1992 – present)
- **Full Membership**, *Boğaziçi University Alumni Association* (1991 – present)
- **Certificate of Appreciation for Service as Editor of the Board**, *Monthly Weather Review, American Meteorological Society* (2021 – 2022)
- **Certificate of Recognition**, *U.S. Department of Commerce NOAA/AOML* (2012)
- **Monthly Weather Review Editor's Award**, *American Meteorological Society* (2011)
- **Group Achievement Award**, *Genesis and Rapid Intensification Processes, NASA* (2011)
- **Certificate of Recognition**, *U.S. Department of Commerce NOAA/AOML* (2011)
- **College of Geosciences Graduate Excellence Scholarship**, *Texas A&M University* (August 2003)
- **Mr. & Mrs. Kenneth P. Pipes Endowed Fellowship in the Geosciences**, *Texas A&M University's College of Geosciences* (August 2002)

## Languages

- English (proficient written and spoken)
- German (competent written and spoken, graduated from Istanbul German High School)
- French (basic written and spoken)
- Turkish (native)