Ryan D. Torn

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EMPLOYMENT

Professor, Department of Atmospheric & Environmental Sciences, University at Albany, State University of New York, Albany, NY, January 2019-Present (Chair since Feb. 2019).

Associate Professor, Department of Atmospheric & Environmental Sciences, University at Albany, State University of New York, Albany, NY, September 2014-January 2019.

Assistant Professor, Department of Atmospheric & Environmental Sciences, University at Albany, State University of New York, Albany, NY, September 2008-August 2014.

Postdoctoral Fellow, Advanced Study Program, National Center for Atmospheric Research, Boulder, CO. August 2007-August 2008.

REFEREED PUBLICATIONS

Zheng, M., F. M. Ralph, V. Tallapragada, A. M. Wilson, S. H. Babbitt, S. M. Bartlett, B. Cao, L. Centurioni, J. M. Cordeira, C. Davis, L. Delle Monache, J. D. Doyle, T. J. Elless, S. Feuer, J. S. Haase, N. Hathaway, T. Hutchinson, P. Iniguez, B. Kawzenuk, E. Knappe, D. A. Lavers, A. Lundry, A. Michaelis, F. Pappenberger, C. A. Reynolds, R. Rickert, S. Roj, J. J. Rutz, A. C. Subramanian, **R. D. Torn**, J. Wang, K. Wu, X. Wu, 2025: Atmospheric River Reconnaissance: Mission Planning, Execution, and Incorporation of Operational and Science Objectives. *Bull. Amer. Meteor. Soc.*, Submitted.

Piper, M. A., **R. D. Torn**, 2024: Comparison of 2018-2022 tropical cyclone track forecasts before and after NOAA G-IV Missions. *Wea. Forecasting*, Accepted.

Capute, P. K., **R. D. Torn**, 2024: A comparison of Arctic and Atlantic basin cyclone track and intensity forecast uncertainty. *Mon. Wea. Rev.*, Accepted.

Cobb, A., F. M. Ralph, V. Tallapragada, A. M. Wilson, C. A. Davis, L. Della Monache, J. D. Doyle, F. Pappenberger, C. A. Reynolds, A. Subramanian, P. G. Black, F. Cannon, C. Castellano, J. M. Cordeira, J. S. Haase, C. Hecht, B. Kawzenuk, D. A. Lavers, M. Murphy, J. Parrish, R.

Rickert, J. J. Rutz, **R. D. Torn**, X. Wu, M. Zheng, 2022: Atmospheric River Reconnaissance 2021: A Review. *Wea. Forecasting*, Acccepted, (PDF).

Torn, R. D., Brennan, M. J. and Dunion, J. P., 2024: Application of ensemble sensitivity for hurricane track forecast sensitivity and flight planning. *Wea. Forecasting*, **40,** 411–424 (PDF).

Rivière, G., J. Delanoë, J. D. Doyle, J. Methven, C. Barrell, M. Fearon, S. Gray, A. Johnson, O. Jourdan, T. Lachlan-Cope, I. Renfrew, **R. D. Torn**, A. Volonté, A. Weiss, M. Wimmer, C. Aubry, A. Baudoux, E. Bazile, D. Beeden, M. Bennett, K. Biernat, C. M. Bitz, E. Blanchard-Wrigglesworth, S. Bounissou, M. Bray, T. Burg, J. Burzdak, S. Businger, P. Capute, C. Caudoux, S. Cavallo, L. Cossalter, C. Cozzolino, H. Croad, V. Douet, A. Elvidge, P. Finocchio, C. Gourbeyre, B. Harvey, K. Huet, T. Hutchinson, R. Ladkin, K. Marshland, O. Martinez-Alvarado, G. Mioche, F. Pantillon, C. Paquette, D. B. Parsons, O. Persson, L. Raillard, J.-C. Raut, Y. Seity, J. Trules, E. Vignon, X. Wang, 2024: The THINICE field campaign: Interactions between Arctic cyclones, tropopause polar vortices, clouds and sea ice in summer. *Bull. Amer. Meteor. Soc.*, **105,** E2330–E2354 (PDF).

Nowottnick, E. P., A. K. Rowe, A. R. Nehrir, J. A. Zawislak, A. J. Piña, W. McCarty, R. A. Barton-Grimley, K. M. Bedka, J. R. Bennett, A. Brammer, M. E. Buzanowicz, G. Chen, S.-H. Chen, S. S. Chen, P. R. Colarco, J. W. Cooney, E. Crosbie, J. Doyle, T. Fehr, R. A. Ferrare, S. D. Harrah, S. M. Hristova-Veleva, B. H. Lambrigtsen, Q. A. Lawton, A. Lee, E. Marinou, E. R. Martin, G. Močnik, E. Mazza, R. Rodriguez Monje, K. M. Núñez Ocasio, Z. Pu, M. Rajagopal, J. S. Reid, C. E. Robinson, R. Rios-Berrios, B. D. Rodenkirch, N. Sakaeda, V. Salazar, M. A. Shook, L. Sinclair, G. M. Skofronick-Jackson, K. L. Thornhill, **R. D. Torn**, D. P. Van Gilst, P. G. Veals, H. Vömel, S. Wong, S.-N. Wu, L. D. Ziemba, E. J. Zipser, 2024: Dust, Convection, Winds and Waves: The 2022 NASA CPEX-CV Campaign. *Bull. Amer. Meteor. Soc.*, **105,** E2097–E2125 (PDF).

Gaudet, L. C., K. J. Sulia, **R. D. Torn**, N. P. Bassill, 2024: Verification of the Global Forecast System, North American Mesoscale Forecast System, and High-Resolution Rapid Refresh Model Near-Surface Forecasts by use of the New York State Mesonet. *Wea. Forecasting*, **39,** 369–386 (PDF).

Zheng, M., **R. D. Torn**, L. Delle Monache, J. Doyle, F. M. Ralph, V. Tallapragada, C. Davis, D. Steinhoff, X. Wu, A. Wilson, C. Papadopoulos, P. Mulrooney, 2024: Improved Sampling Strategies for Atmospheric River Reconnaissance. *Mon. Wea. Rev.*, **152,** 811–835 (PDF).

Li, Y., J. Heming, **R. D. Torn**, S. Lai, Y. Xu, X. Chen, 2023: Unusual tracks: Statistical, controlling factors and model prediction. *Trop. Cyclone Research* **12,** 309–322 (PDF).

Dunion, J. P., C. Davis, H. Titley, H. Greatrex, M. Yamaguchi, J. Methven, R. Ashrit, Z. Wang, H. Yu, A.-C. Fontan, A. Brammer, M. Kucas, M. Ford, P. Papin, F. Prates, A. Kruczkiewicz, P.

Chakraborty, A. Burton, M. DeMaria, C. Mooney, **R. Torn**, J. L. Vigh, 2023: Recommendations for Improved Tropical Cyclone Formation and Position Probabilistic Forecast Products. *Trop. Cyclone Research* **12,** 241–258 (PDF).

Lavers, D. A., **R. D. Torn**, C. Davis, D. S. Richardson, F. M. Ralph, F. Pappenberger, 2023: Foreacast Evaluation of the North Pacific Jet Stream Using AR Recon Dropwindsondes. *Quart. J. Roy. Meteor. Soc.*, **149,** 3044–3063 (PDF).

Hazelton, A., G. J. Alaka, Jr., M. S. Fischer, **R. D. Torn**, S. Gopalakrishnan, 2023: Factors influencing the track of Hurricane Dorian (2019) in the West Atlantic: Analysis of a HAFS Ensemble. *Mon. Wea. Rev.*, **151,** 175–192 (PDF).

Fischer, M. S., P. Reasor, B. A. H. Tang, K. L. Corbosiero, **R. D. Torn**, 2023: A Tale of Two Vortex Evolutions: Using a High-Resolution Ensemble to Assess the Impacts of Ventilation on a Tropical Cyclone Rapid Intensification Event. *Mon. Wea. Rev.*, **151,** 297–320 (PDF).

Zhao, X., **R. D. Torn**, 2022: Evaluation of Independent Stochastically Perturbed Parameterization Tendency (iSPPT) Scheme on HWRF-based Ensemble Tropical Cyclone Intensity Forecasts. *Mon. Wea. Rev.*, **150,** 2659–2674 (PDF).

Berman, J. D., and **R. D. Torn** 2022: The Sensitivity of Downstream Waveguide Forecasts to Upstream Warm Conveyor Belt Forecast Uncertainty using MPAS. *Mon. Wea. Rev.*, **150,** 2573–2592 (PDF).

Richardson, J., **R. D. Torn**, B. H. Tang, 2022: An Analog Comparison between Rapidly and Slowly Intensifying Tropical Cyclones. *Mon. Wea. Rev.*, **150,** 2139–2156 (PDF).

Lupo, K. M. and **R. D. Torn** 2022: Process-Based Evaluation of Stochastic Perturbed Parameterization Tendencies on Ensemble Forecasts of Heavy Rainfall Events. Part I: Microphysics Perturbations. *Mon. Wea. Rev.*, **150,** 175–191 (PDF).

Chen, C.-H., K.-S. Chung, S.-C. Yang, L.-H. Chen, P.-L. Lin, **R. D. Torn**, 2021: Sensitivity of forecast uncertainty to different microphysics schemes within a convection-allowing ensemble during SoWMEX-IOP8. *Mon. Wea. Rev.*, **149,** 4145–4166 (PDF).

Bachmann, K. A. and **R. D. Torn** 2021: Validation of HWRF-based Probabilistic TC Wind and Precipitation Forecasts. *Wea. Forecasting*, **36,** 2057–2070 (PDF).

Capute, P. K., and **R. D. Torn**, 2021: A Comparison of Arctic and Atlantic Cyclone Predictability. *Mon. Wea. Rev.*, **149,** 3837–3849 (PDF).

Torn, R. D., and M. DeMaria, 2021: Validation of Ensemble-based Probabilistic Tropical Cyclone Intensity Change. *Atmosphere*, **12,** 373. DOI: 10.3390/atmos12030373 (PDF).

Smith, M. B., **R. D. Torn**, K. L. Corbosiero, P. Pegion, 2020: Ensemble variability in rainfall forecasts of Hurricane Irene (2011). *Wea. Forecasting*, **35,** 1761–1781 (PDF).

Lavers, D. A., B. Ingleby, A. Subramanian, D. S. Richardson, F. M. Ralph, J. D. Doyle, C. A. Reynolds, **R. D. Torn**, M. J. Rodwell, V. Tallapragada, F. Pappenberger, 2020: Forecast Errors and Uncertainties in Atmospheric Rivers. *Wea. Forecasting*, **35,** 1447–1458 (PDF).

Papin, P. P., L. F. Bosart, **R. D. Torn**, 2020: A Feature Based Approach to Classifying Summertime Potential Vorticity Streamers Linked to Rossby Wave Breaking in the North Atlantic Basin. *J. Climate*, **33,** 5953–5969 (PDF).

Wick, G. A., J. P. Dunion, P. G. Black, J. R. Walker, **R. D. Torn**, A. C. Kren, A. Aksoy, H. Christophersen, H., L. Cucurull, B. Dahl, J. M. English, K. Friedman, T. R. Peevey, K. Sellwood, J. A. Sippel, V. Tallapragada, J. Taylor, R. E. Hood, P. Hall, 2020: NOAA'S Sensing Hazards With Operational Unmanned Technology (SHOUT) Experiment. *Bull. Amer. Meteor. Soc.*, **101,** E968–E987 (PDF).

Tymochko, S., E. Munch, J. Dunion, K. L. Corbosiero, **R. D. Torn**, 2020: Using persistent homology to quantify a diurnal cycle in hurricanes. *Pattern Recognition Letters* **133,** 137–143 (PDF).

Lupo, K. M., **R. D. Torn**, S.-C. A. Yang, 2020: Evaluation of Stochastic Perturbed Parameterization Tendencies on Convective-Permitting Ensemble Forecasts of Heavy Rainfall Events in New York and Taiwan. *Wea. Forecasting*, **35,** 5–24 (PDF).

Magnusson, L., J. D. Doyle, **R. D. Torn**, C. K. Tang, M. Yamaguchi, F. Zhang, 2019: Advances in Understanding Difficult Cases of Track Forecasts. *Trop. Cyclone Research* **8,** 109–122 (PDF).

Berman, J. D., and **R. D. Torn**, 2019: The impact of warm conveyor belt forecast errors on variability in the downstream waveguide in an ECWMF case study. *Mon. Wea. Rev.*, **147,** 4071–4089 (PDF).

Elless, T. J., and **R. D. Torn**, 2019: The role of environmental factors in the predictability of African Easterly Waves. *Mon. Wea. Rev.*, **147,** 1679-1698 (PDF).

Coniglio, M. C., G. S. Romine, D. D. Turner, and **R. D. Torn**, 2019: Impacts of Targeted AERI and Doppler Lidar Wind Retrievals on Short-Term Forecasts of the Initiation and Early Evolution of Thunderstorms. *Mon. Wea. Rev.*, **147,** 1149-1170 (PDF).

Keller, J. H., C. M. Grams, M. Riemer, H. M. Archambault, L. Bosart, J. D. Doyle, J. L. Evans, T. J. Galarneau, K. Griffin, P. A. Harr, N. Kitabatake, R. McTaggart-Cowan, F. Pantillon, J. Quinting, C. A. Reynolds, E. A. Ritchie, **R. D. Torn**, and F. Zhang, 2019: The Extratropical Transition of Tropical Cyclones Part II: Interaction with the midlatitude flow, downstream impacts, and implications for predictability. *Mon. Wea. Rev.*, **147,** 1077-1106 (PDF).

Rios-Berrios, R., **R. D. Torn**, C. A. Davis, 2018: A Hypothesis for the Intensification of Tropical Cyclones under Moderate Vertical Wind Shear. *J. Atmos. Sci.*, **75,** 4149-4173 (PDF).

Torn, R. D., T. J. Elless, P. P. Papin, C. A. Davis, 2018: Tropical Cyclone Track Sensitivity in Deformation Steering Flow. *Mon. Wea. Rev.*, **146,** 3183-3201 (PDF).

Elless, T. J., and **R. D. Torn**, 2018: African Easterly Wave Forecast Verification and its Relation to Convective Errors within the ECMWF Ensemble Prediction System. *Wea. Forecasting*, **33,** 461-477 (PDF).

Halperin, D., and **R. D. Torn**, 2018: Diagnosing conditions associated with large intensity forecast errors in the Hurricane Weather Research and Forecasting (HWRF) model. *Wea. Forecasting*, **33,** 239-266 (PDF).

Torn, R. D., 2017: A comparison of the downstream predictability associated with ET and baroclinic cyclones. *Mon. Wea. Rev.*, **145,** 4651–4672 (PDF).

Berman, J. D., **R. D. Torn**, G. S. Romine, and M. L. Weisman, 2017: Sensitivity of Northern Great Plains Convection Forecasts to Upstream and Downstream Forecast Errors. *Mon. Wea. Rev.*, **145,** 2141-2163 (PDF).

Papin, P. P., L. F. Bosart, **R. D. Torn**, 2017: A Climatology of Central American Gyres. *Mon. Wea. Rev.*, **145,** 1983–2000 (PDF).

Torn, R. D., G. S. Romine, T. J. Galarneau Jr., 2017: Sensitivity of Dryline Convection Forecasts to Upstream Forecast Errors for Two Weakly Forced MPEX Cases. *Mon. Wea. Rev.*, **145,** 1831-1852 (PDF).

Rios-Berrios, R., **R. D. Torn**, 2017: Climatological analysis of tropical cyclone intensity changes under moderate vertical wind shear. *Mon. Wea. Rev.*, **145,** 1717-1738 (PDF).

Romine, G. S., C. S. Schwartz, **R. D. Torn**, M. L. Weisman, 2016: Impact of assimilating dropsonde observations from MPEX on ensemble forecasts of severe weather events. *Mon. Wea. Rev.*, **144,** 3799–3823 (PDF).

Torn, R. D., 2016: Evaluation of atmosphere and ocean initial condition uncertainty and stochastic exchange coefficients on ensemble tropical cyclone intensity forecasts. *Mon. Wea. Rev.*, **144,** 3487–3506 (PDF).

Lamberson, W., **R. D. Torn**, L. F. Bosart, L. Magnusson, 2016: Diagnosis of the source and evolution of medium-range forecast errors for extratropical cyclone Joachim. *Wea. Forecasting*, **31,** 1197–1214 (PDF).

Rios-Berrios, R., **R. D. Torn**, C. Davis, 2016: An ensemble approach to investigate tropical cyclone intensification in sheared environments. Part II: Ophelia (2011). *J. Atmos. Sci.*, **73,** 1555–1575 (PDF).

Rios-Berrios, R., **R. D. Torn**, C. Davis, 2016: An ensemble approach to investigate tropical cyclone intensification in sheared environments. Part I: Katia (2011). *J. Atmos. Sci.*, **73,** 71–93

(PDF).

Weisman, M. L., R. J. Trapp, G. S. Romine, C. Davis, **R. Torn**, M. Baldwin, L. Bosart, J. Brown, M. Coniglio, D. Dowell, A. C. Evans, T. J. Galarneau Jr., J. Haggerty, T. Hock, K. Manning, P. Roebber, P. Romashkin, R. Schumacher, C. S. Schwartz, R. Sobash, D. Stensrud, S. Trier, 2015: The Mesoscale Predictability Experiment (MPEX). *Bull. Amer. Meteor. Soc.*, **96,** 2127–2149 (PDF).

Chen, S.-H., Y.-C. Liu, T. R. Nathan, C. Davis, **R. Torn**, N. Sowa, C.-T. Cheng, J.-P. Chen, 2015: Modeling the effects of dust-radiative forcing on the movement of Hurricane Helene (2006). *Quart. J. Roy. Meteor. Soc.*, **141,** doi:10.1002/qj.2542. (PDF).

Torn, R. D., and G. Romine, 2015: Sensitivity of Central Oklahoma convection forecasts to upstream potential vorticity anomalies during two strongly-forced cases during MPEX. *Mon. Wea. Rev.*, **143,** 4064–4087 (PDF).

Torn, R. D., and G. J. Hakim, 2015: Comparison of wave packets associated with extratropical transition and winter cyclones. *Mon. Wea. Rev.*, **143,** 1782–1803 (PDF).

Torn, R. D., J. S. Whitaker, P. Pegion, T. M. Hamill, G. J. Hakim, 2015: Diagnosis of the source of GFS medium range track errors in Hurricane Sandy (2012). *Mon. Wea. Rev.*, **143,** 132–152 (PDF).

Majumdar, S. J., and **R. D. Torn**, 2014: Probabilistic verification of global and mesoscale ensemble forecasts of tropical cyclogenesis. *Wea. Forecasting*, **29,** 1181–1198 (PDF).

Torn, R. D., 2014: The impact of targeted dropwindsonde observations on tropical cyclone intensity forecasts of four weak systems during PREDICT. *Mon. Wea. Rev.*, **142,** 2860–2878 (PDF).

Cavallo, S. M., **R. D. Torn**, C. Snyder, C. Davis, W. Wang and J. Done, 2012: Evaluation of the Advanced Hurricane WRF data assimilation system for the 2009 Atlantic hurricane season. *Mon. Wea. Rev.*, **141,** 523–541 (PDF).

Torn R. D., and D. Cook, 2012: The role of vortex and environment errors in Hurricanes Danielle and Karl (2010) genesis forecasts. *Mon. Wea. Rev.*, **141,** 232–251 (PDF).

Torn, R. D., and C. A. Davis, 2012: The influence of shallow convection on tropical cyclone track forecasts. *Mon. Wea. Rev.*, **140,** 2188–2197 (PDF).

Torn, R. D. and C. Snyder, 2012: Uncertainty of tropical cyclone best track information. *Wea. Forecasting*, **27,** 715–729 (PDF).

Montgomery, M. T., C. Davis, T. Dunkerton, Z. Wang, C. Velden, **R. Torn**, S. Majumdar, F. Zhang, R. K. Smith, L. Bosart, M. M. Bell, J. S. Haase, A. Heymsfield, J. Jensen, T. Campos and M. A. Boothe, 2011: The Pre-Depression Investigation of Cloud Systems in the Tropics

(PREDICT) Experiment: Scientific Basis, New Analysis Tools, and Some First Results. *Bull. Amer. Meteor. Soc.*, , **93,** 153–172 (PDF).

Davis, C., W. Wang, S. Cavallo, J. Done, J. Dudhia, S. Fredrick, J. Michalakes, G. Caldwell, T. Engel, and **R. Torn**, 2011: High-resolution hurricane forecasts. *Computing in Science and Engineering*, **13,** 22–30. (PDF).

Davis, C., W. Wang, J. Dudhia, and **R. Torn**, 2010b: Does increased horizontal resolution improve hurricane wind forecasts. *Wea. Forecasting*, **25,** 1826–1841 (PDF).

Torn, R. D., 2010c: Performance of a Mesoscale Ensemble Kalman Filter (EnKF) During the NOAA High-Resolution Hurricane Test. *Mon. Wea. Rev.*, **138,** 4375–4392 (PDF).

Torn, R. D., 2010b: Diagnosis of the Downstream Ridging Associated with Extratropical Transition Using Short-term Ensemble Forecasts. *J. Atmos. Sci.*, **67,** 817–833 (PDF).

Torn, R. D., 2010a: Ensemble-based sensitivity analysis applied to African Easterly Waves. *Wea. Forecasting*, **25,** 61–78. (PDF).

Anderson, J, and T. Hoar, K. Raeder, H. Liu, N. Collins, **R. Torn**, and A. Arellano, 2009: The Data Assimilation Research Testbed: A community data assimilation facility. *Bull. Amer. Meteor. Soc.*, **90,** 1283–1296. (PDF).

Torn, R. D., and G. J. Hakim, 2009: Initial condition sensitivities of western Pacific extratropical transition events. *Mon. Wea. Rev.*, **137,** 3388–3406 (PDF).

Torn, R. D., and G. J. Hakim, 2009: Ensemble Data Assimilation applied to RAINEX observations of Hurricane Katrina (2005). *Mon. Wea. Rev.*, **137,** 2817–2829 (PDF).

Hakim, G. J., and **R. D. Torn**, 2008: Ensemble Synoptic Analysis. *Fred Sanders Monograph*, Lance Bosart and Howard Bluestein, eds., American Meteorological Society, 147-161 (PDF).

Torn, R. D., and G. J. Hakim, 2008: Performance characteristics of a pseudo-operational Ensemble Kalman Filter. *Mon. Wea. Rev.*, **136,** 3947–3963 (PDF).

Torn, R. D., and G. J. Hakim, 2008: Ensemble-based sensitivity analysis. *Mon. Wea. Rev.*, **136,** 663–677 (PDF).

Dirren, S., **R. D. Torn**, and G. J. Hakim, 2007: A data assimilation case-study using a limited-area ensemble Kalman filter. *Mon. Wea. Rev.*, **135,** 1455–1473 (PDF).

Torn, R. D., G. J. Hakim, and C. Snyder, 2006: Boundary conditions for a limited-area ensemble Kalman filter. *Mon. Wea. Rev.*, **134,** 2490–2502. (PDF).

Anderson, M. C., J. M. Norman, J. R. Mecikalski, **R. D. Torn**, W. P. Kustas, J. P. Basara, 2004: A multi-scale remote sensing model for disaggregating regional fluxes to micrometeorological scales. *J. Hydrometeorol.*, **5,** 343–363 (PDF).

Diak, G. R., J. R. Mecikalski, M. C. Anderson, J. M. Norman, W. P. Kustas, **R. D. Torn** and R. L. DeWolf, 2004: Estimating land-surface energy budgets from space: Review and current efforts at the University of Wisconsin-Madison and USDA/ARS. *Bull. Amer. Meteor. Soc.*, **56,** 21–30 (PDF).

Norman, J. M., M. C. Anderson, W. P. Kustas, A. N. French, J. R. Mecikalski, **R. D. Torn**, G. R. Diak, T. J. Schmugge, and B. C. W. Tanner, 2003: Remote sensing surface energy fluxes at 10^1 m pixel resolutions. *Water Resour. Res.*, **39,** 9-1–17 (PDF).

Torn, R. D., and G. M. Nathanson, 2002: Surface tensions and surface segregation of n-butanol in sulfuric acid. *J. Phys. Chem. B*, **106,** 8064–8069 (PDF).

RESEARCH GRANTS

Evaluation of the Weather Types and Predictability Associated with Heavy Northeast US Precipitation (PI: Ryan Torn), US Army Corps of Engineers (subaward to the University at Albany via the Center for Western Weather and Water Extremes), $599,911,
15 August 2024-14 August 2028.

Expansion of Ensemble-based Sensitivity to TC Hazard Forecasts (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA22OAR4590528, $314,702,
1 August 2022-31 July 2025.

West Coast Weather Regimes: Onset, Persistance and Demise (Co-I: Ryan Torn), California Department of Water Resources (subaward to University at Albany) $297,192
1 July 2020-30 June 2024.

Application of Innovation Statistics to Diagnose Biases in the HAFS system (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA20NWS4680050, $292,483, 1 September 2020-31 August 2022.

Transitioning Ensemble-based TC Track and Intensity Sensitivity to Operations (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA19OAR4590129, $149,880, 1 July 2019-30 June 2021.

Evaluating Initial Condition Perturbation Methods in the HWRF Ensemble Prediction System (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA18NWS4680060, $292,483, 1 September 2018-31 August 2020.

Comparison of Polar and Midlatitude Cyclone Predictability Using Ensemble-based Sensitivity Analysis (PI: Ryan Torn), Office of Naval Research Award Number 12484225, $615,676,
1 January 2018-31 December 2022.

Evaluating Methods of Parameterizing Model Error in the HWRF Ensemble Prediction System (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA16NWS4680025, $328,574, 1 September 2016-31 August 2018 (Abstract).

PIRE: Building Extreme Weather Resiliency and Global Community Resiliency Through Improved Weather and Climate Prediction and Emergency Response Strategies (Co-I: Ryan Torn), National Science Foundation Award Number 1545917, $4,497,533, 15 September 2015-31 August 2020 (Abstract).

The role of uncertainty in waveguide perturbations on midlatitude predictability with DOWNSTREAM (PI: Ryan Torn), National Science Foundation Award Number 1461753, $318,277, 1 September 2015-31 August 2018 (Abstract).

Using NOAA UAS Assets and OSSE/DA Capabilities to Improve Sampling Strategies and Numerical Prediction of Tropical Cyclone Track, Intensity, and Structure (Co-I: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA14OAR4830172, (subaward to University at Albany) $238,697 1 August 2014-30 September 2015 (Abstract).

Assessing the Predictability of Tropical Cyclone Intensity using HWRF (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA14NWS4680027, $337,385 1 August 2014-31 July 2016 (Abstract).

Variability and Predictability of African Easterly Waves (PI: Chris Thorncroft, Ryan Torn), National Science Foundation Award Number 1321568, $665,287, 1 June 2013-31 May 2016 (Abstract).

Sources and growth of initial condition errors in convection-resolving forecasts in MPEX (PI: Ryan Torn), National Science Foundation Award Number 1239787, $326,288, 1 November 2012-31 October 2015. (Abstract).

Evaluating Hurricane Intensity Predictability using the Advanced Hurricane WRF (PI: Ryan Torn), National Oceanographic and Atmospheric Administration Award Number NA12NWS4680003, $150,000, 1 January 2012-31 December 2013 (Abstract).

Tasks to Support FY10 NOAA Hurricane Forecast Improvement Project (HFIP) (PI: Ryan Torn), University Corporation for Atmospheric Research Subaward Number 55272, $46,100, 17 July 2010-30 June 2011.

Collaborative Research: Ensemble-based Predictability, Sensitivity and Data Assimilation in PREDICT (PI: Ryan Torn), National Science Foundation Award Number 0848409, $278,595, 1 September 2009-31 August 2012 (Abstract).

DEPARTMENT & UNIVERSITY SERVICE

co-Chair of College of Arts and Sciences Comprehensive Review Committee, 2024.

co-Chair of Working Group V for the UAlbany Middle States Self Study, September 2018-June 2020.

Undergraduate Academic Council Committee on Academic Standing 2012-2019.

Department of Atmospheric & Environmental Sciences (DAES) ETEC Building Committee, 2014-2021.

Department of Atmospheric & Environmental Sciences (DAES) Graduate Program Director, 2013-2018.

University Strategic Planning Committee, Research Excellence, Fall 2018.

Panelist for Doctoral Student Discussion Forum for the Sciences, September 2017.

Panelist for Forum for Students in the Master's programs and B.A./M.A. (B.S./M.A.) combined programs, February 2017.

University Strategic Planning Committee, Reshape Programs and Enrollments for a 21st Century University (Graduate), Spring 2017.

UAlbany Graduate Student Stipend Commmittee, 2015.

Chair of Department of Atmospheric & Environmental Sciences (DAES) Faculty Search Committee (hired two people), 2012-2013 academic year.

Department of Atmospheric & Environmental Sciences (DAES) Faculty Search Committee (hired two people), 2011-2012 academic year.

Department of Atmospheric & Environmental Sciences (DAES) Undergraduate Committee, 2011-2013.

Department of Atmospheric & Environmental Sciences & Atmospheric Sciences Research Center Joint Colloquium co-coordinator 2009-2011

PROFESSIONAL SERVICE

Developmental Testbed Center Science Advisory Board, July 2021-present.

National Oceanographic and Atmospheric Administration (NOAA) Community Model Review Committee, July 2018-present.

NCAR Observing Facilities Assessment Panel, 2019-2023 (chair for 2022-2023).

National Weather Service Next Generation Global Prediction System Ensemble Working Group co-chair, 2017-present.

National Science Foundation Allocation Panel, 2010-2019 (chair from 2016-2019)

Editor, *Monthly Weather Review*, 2016-2019.

Co-organizer of the HFIP Workshop on Effective Use of Hurricane Ensembles, 2015.

Associate Editor, *Monthly Weather Review*, 2010-2015, 2020-present.

US THORPEX Science Steering Committee 2012-2014.

Associate Editor, *Weather Analysis and Forecasting*, 2007-2014.

Mentor, American Meteorological Society Water in the Earth System (WES) and Earth Climate System (ECS) Teacher Enhancement Project, 2008-2013.

Reviewer for: *Bulletin of the American Meteorological Society, Journal of the Atmospheric Sciences, Monthly Weather Review, Weather and Forecasting, Journal of Geophysical Research, the National Science Foundation, and Tellus*

MENTORING

Postdoctoral Scholars

Nick Bassill (Joint with New York Mesonet)
Dan Halperin (2015-2016)
Xiaohui Zhao (2017-2020)
Kevin Bachmann (2019-2021)
Eun-Gyeong Yang (2021-2022)
Bo-Yi Lu (2024-)

Graduate Students

Travis Elless (MS 2015; Ph.D. 2018)
Philippe Papin (co-advised with Lance Bosart; MS: 2014, Ph.D. 2017)
Rosimar Rios-Berrios (Ph.D 2017)
Jeremy Berman (PhD 2020)
Molly Smith (co-advised with Kristen Corbosiero; M.S. 2017)
William Lamberson (co-advised with Lance Bosart; MS 2015)
Meghan Conway (MS 2019)
Kevin Lupo (PhD 2021)

Adam Sisko (MS 2021)
Jannetta Richardson (co-advised with Brian Tang; MS 2020, current PhD student)
Cidny Rameriz-Martinez (MS 2023)
Peyton Capute (PhD 2024)
Ivan Fontanez (current MS student)
Melissa Piper (current PhD student)
Michael Barletta (current PhD student)
Evan Belkin (current PhD student)

Undergraduate Students

Gabriel Susa-Lopata (B.S. in Atmospheric Science with Honors, May 2011)
Nick Farrugio (B.S. in Atmospheric Science, May 2014)
Tomer Burg (B.S. in Atmospheric Science, May 2016)
Mansour Riachy (B.S. in Atmospheric Science, May 2018)
Rosa Martas-Vargas (B.S. in Atmospheric Science, May 2018)
Michael Barletta (B.S. in Atmospheric Science, May 2023)

HONORS

President's Award for Excellence in Research and Creative Activities, 2024.

AMS Editors Award, 2011.

AMS Graduate Fellowship, American Meteorological Society, 2002.

Phi Beta Kappa

Lyle Horn Award, University of Wisconsin-Madison, Department of Atmospheric and Oceanic Science, 2001.

Hilldale Research Fellowship, University of Wisconsin-Madison, 2001.

University Bookstore Research Award, University of Wisconsin-Madison, 2001.

AMS Undergraduate Scholarship, American Meteorological Society, 2000.

Wayland Noland Research Fellowship, University of Wisconsin-Madison Chemistry Department, 2000.

INVITED TALKS

Torn, R. D., 2023: Ensemble-based Sensitivity Guidance for Understanding TC Track Uncertainty and Observation Targeting, University of North Dakota Seminar.

Torn, R. D., 2023: Application of Ensemble Sensitivity during the 2022/2023 AR-Recon Season, 2023 Winter Season Working Group Meeting, La Jolla, CA.

Titley, H., F. Prates, R. D. Torn, 2021: Resources for Producing Probabilistic Forecasts, WMO Tropical Cyclone-Probabilistic Forecast Products Workshop, Virtual.

Torn, R. D., 2020: Application of Ensemble-based Sensitivity in Operational Observation Collection During Extreme Weather Events. 2020 AGU Fall Meeting, Virtual.

Torn, R., D., 2017: On Using Ensemble Forecasts for Atmospheric Dynamics and Predictability, Waves to Weather Annual meeting, Kempten Germany.

Torn, R. D., 2016: A Comparison of the Downstream Predictability Associated with ET and Baroclinic Cyclones. NCAR MMM Seminar, Boulder, CO.

Torn, R. D., 2015: Ensemble-based Data Assimilation for Tropical Cyclones: Current Progress and Future Plans. Frontiers in Ensemble Data Assimilation, Boulder, CO.

Torn, R. D., 2014: The relative contribution of atmospheric and oceanic uncertainty in TC intensity forecasts. World Weather Opean Science Conference, Montreal, Quebec, CA.

Torn, R. D., 2013: Estimating the origin and evolution of tropical cyclone track and intensity errors. National Center for Atmospheric Research Advanced Study Program Seminar, Boulder, CO.

Torn, R. D., C. Davis, W. Wang, C. Snyder, 2013: The relative contribution of atmospheric and oceanic uncertainty in TC intensity forecasts. Tropical Cyclone Research Forum, College Park, MD.

Torn, R. D., 2012: Developing a framework for understanding the sensitivity of tropical cyclone genesis forecasts to initial conditions, National Hurricane Center Seminar, Miami, FL.

Torn, R. D., S. Cavallo, C. Davis, C. Snyder, W. Wang, J. Done, 2010: Ensemble-Based Data Assimilation and Hurricane Prediction. National Severe Storms Laboratory Summer Seminar Series, Norman, OK.

Torn, R. D., S. Cavallo, C. Davis, C. Snyder, W. Wang, J. Done, 2010: Ensemble-Based Data Assimilation and Hurricane Prediction. Stony Brook University School of Marine and Atmospheric Sciences Seminar Series, Stony Brook, NY.

Torn, R. D., S. Cavallo, C. Davis, C. Snyder, W. Wang, and J. Done, 2009: Ensemble-based Data Assimilation and Hurricane Prediction. National Workshop on Mesoscale Probabilistic

Prediction. Boulder, CO, September 2009.

Torn, R. D., 2008: Application of Ensemble Data Assimilation for Predictability. CAOS Workshop 2008: Real Time Filtering and Prediction for Turbulent Signals in Weather and Climate. New York University, December 2008.

Torn, R. D., 2008: Ensemble Data Assimilation Applied to Hurricanes Katrina and Rita (2005). National Oceanographic and Atmospheric Administration Earth Science Research Laboratory Seminar. Boulder, CO June 2008.

SELECT CONFERENCE, WORKSHOP AND SYMPOSIA

Torn, R. D., J. M. Cordeira, F. M. Ralph, 2025: A Climatology of Forecast Sensitivity for Landfalling Atmospheric Rivers along the US West Coast, 15th Conference On Transition Of Research To Operations, AMS Annual Meeting, New Orleans, LA.

Torn, R. D., J. M. Cordeira, 2024: A Climatology of Forecast Sensitivity for Landfalling Atmospheric Rivers along the US West Coast, Atmospheric River Reconnaissance Workshop, College Park, MD.

Torn, R. D., 2024: Application of Ensemble-based Sensitivity Tools for AR Recon, International Atmospheric Rivers Conference, La Jolla, CA.

Torn, R. D., 2024: Expansion of Ensemble-based Sensitivity to TC Hazard Forecasts, 36th Conference on Hurricanes and Tropical Meteorology, Long Beach, CA.

Torn, R. D., 2024: Expansion of Ensemble-based Sensitivity to TC Hazard Forecasts, Tropical Cyclone Operations and Research Forum, Virtual.

Torn, R. D., 2023: Application of Ensemble Sensitivity during the 2022/2023 AR-Recon Season, 32nd Conference on Weather Analysis and Forecasting (WAF)/28th Conference on Numerical Weather Prediction (NWP), Madison, WI.

Torn, R. D., 2023: Application of Ensemble Sensitivity during the 2022/2023 AR-Recon Season, Atmospheric River Reconnaissance Workshop, Reading, UK.

Torn, R. D., 2023: Expansion of Ensemble-based Sensitivity to TC Hazard Forecasts, 2023 Tropical Cyclone Operations and Research Forum, Virtual.

Torn, R. D., 2022: Medium Range Forecast Sensitivity for Landfalling ARs along the US West Coast, International Atmospheric Rivers Conference, Santiago, Chile/Virtual.

Torn, R. D., 2022: Ensemble-based Sensitivity Guidance for Reducing TC Track Forecast Uncertainty, 35th Conference on Hurricanes and Tropical Meteorology, New Orleans, LA.

Torn, R. D., 2022: Transitioning Ensemble-based TC Track and Intensity Sensitivity to Operations: Current Status and Future Plans, 2022 Tropical Cyclone Operations and Research Forum, Virtual.

Torn, R. D., 2022: The Evolution of Forecast Sensitivity for a Landfalling Atmospheric River during AR Recon 2021, 31st Conference on Weather Analysis and Forecasting (WAF)/27th Conference on Numerical Weather Prediction (NWP), Virtual.

Torn, R. D, 2021: Application of Ensemble-based Sensitivity for Landfalling TC Wind and Precipitation Forecasts, 34th Conference on Hurricanes and Tropical Meteorology, Virtual.

Torn, R. D., 2021: Transitioning Ensemble-based TC Track and Intensity Sensitivity to Operations: Current Status and Future Plans, 2021 Tropical Cyclone Operations and Research Forum, Virtual.

Torn, R. D., 2020: Application of Ensemble Sensitivity during the AR Recon 2020 Experiment. 3rd International Atmospheric Rivers Conference, Virtual.

Torn, R. D., 2020: Transitioning Ensemble-based TC Track and Intensity Sensitivity to Operations: Current Status and Future Plans, 2020 Tropical Cyclone Operations and Research Forum, Lakeland, FL.

Torn, R. D., 2020: Application of Ensemble Sensitivity during the AR-Recon 2019 Experiment, 30th Conference on Weather Analysis and Forecasting / 26th Conference on Numerical Weather Prediction, Boston, MA.

Torn, R. D., 2019: Application of Ensemble-based Sensitivity to ECMWF Ensemble Forecasts in Field Campaigns, ECMWF Workshop: Observational campaigns for better weather forecasts, Reading UK.

Torn, R. D., R. M. Martas Vargas, 2018: On the Predictability of Hurricane Irma's Precipitation Forecasts During Landfall, Asia Oceania Geosciences Society 15th Annual Meeting, Honolulu, HI.

Torn, R. D., M. DeMaria, 2018: Real-Time, Ensemble-Based Probabilities of Tropical Cyclone Rapid Intensification, 33rd Conference on Hurricanes and Tropical Meteorology, Ponte Vedra, FL.

Torn, R. D, 2018: The Sensitivity of Hurricane Irma's Track Forecasts As Determined from ECMWF Ensemble Forecasts, 33rd Conference on Hurricanes and Tropical Meteorology, Ponte Vedra, FL.

Torn, R. D., M. DeMaria, 2017: Real-Time, Ensemble-Based Probabilities of Tropical Cyclone Rapid Intensification, Tropical Cyclone Operations & Research Symposium, Miami, FL.

Torn, R. D., R. Rios-Berrios, Z. Zhang, A. Brammar, 2017: Application of Ensemble-Based Sensitivity Analysis During SHOUT. 28th Conference on Weather Analysis and Forecasting /

24th Conference on Numerical Weather Prediction, Seattle, WA.

Torn, R. D., G. S. Romine, T. J. Galarneau, 2016: Sensitivity of Dryline Convection Forecasts to Upstream Forecast Errors for Two Weakly Forced MPEX Cases. 28th Conference on Severe and Local Storms, Portland, OR.

Torn, R. D. 2016: Evaluating the Predictability of TC Intensity Using the HWRF Ensemble Prediction System. 32th Conference on Hurricanes and Tropical Meteorology, San Juan, PR.

Torn, R. D. 2016: A Comparison of the Downstream Predictability Associated with Extratropical Transition and Baroclinic Cyclones. 32th Conference on Hurricanes and Tropical Meteorology, San Juan, PR. (poster)

Torn, R. D, 2015: Application of HWRF ensemble forecasts for prediction and observation targeting. HFIP Workshop on Effective Use of Hurricane Ensembles, Miami, FL.

Torn, R. D., G. S. Romine, 2014: Evaluating the sensitivity of convection forecasts with large synoptic forcing during MPEX. 27th Conference on Severe and Local Storms, Madison, WI.

Torn, R. D., J. S. Whitaker, T. M. Hamill, G. J. Hakim, 2013: Diagnosis of the Extreme Track Forecast Differences of Hurricane Sandy (2012). 16th Cyclone Workshop, Sainte-Adele, Quebec.

Torn, R. D., 2012: Developing a framework for understanding the sensitivity of tropical cyclone genesis forecasts to initial conditions, National Center for Atmospheric Research Mesoscale and Microscale Meteorology Seminar, Boulder, CO.

Torn, R. D., 2012: Sensitivity Analysis Applied to Tropical Cyclone Intensity, and Extratropical Transition. United States The Observing System Research and Predictability Experiment (THORPEX) Workshop, College Park, MD.

Torn, R. D., C. Davis, C. Snyder, W. Wang, J. Done, 2012: The Advanced Hurricane WRF (AHW) Ensemble Data Assimilation System: Current Status and Future Plans. 5th EnKF Workshop, Rensselaerville, NY.

Torn, R. D. and C. Davis, 2012: Treatment of model-related biases in an ensemble based data assimilation system. 5th EnKF Workshop, Rensselaerville, NY. (poster)

Torn, R. D. and G. J. Hakim, 2012: A Comparison of Western Pacific ET-induced Rossby Wave packets with those associated with midlatitude cyclones. 30th Conference on Hurricanes and Tropical Meteorology, Ponte Vedra Beach, FL. (poster)

Torn, R. D. and D. Cook, 2012: The sensitivity of pre-genesis forecasts of Hurricanes Danielle and Karl (2010) to pouch and environmental initial conditions. 30th Conference on Hurricanes and Tropical Meteorology, Ponte Vedra Beach, FL.

Torn, R. D., 2011: AHW Ensemble Data Assimilation and Forecasting System. HFIP Regional

GSI-Hybrid Data Assimilation Workshop. Miami, FL.

Torn, R. D. and D. Cook, 2011: The role of initial condition errors in Danielle and Karl's genesis forecasts. PREDICT Science Workshop, Monterey, CA.

Torn, R. D., S. Cavallo, C. Davis, C. Snyder, W. Wang, J. Done, 2010: SUNY/NCAR AHW Initialization. Hurricane WRF Initialization Workshop, Camp Springs, MD.

Torn, R. D., S. Cavallo, C. Davis, C. Snyder, 2010: Real-Time Mesoscale Ensemble Data Assimilation for Atlantic TC. 29th Conference on Hurricanes and Tropical Meteorology, American Meteorological Society, Tucson, AZ.

Torn, R. D., S. Cavallo, C. Davis, C. Snyder, W. Wang, J. Done, 2010: ARW/EnKF performance for the 2009 Hurricane Season. 4th EnKF Workshop, Rensselaerville, NY.

Torn, R. D., 2008: High-resolution ensemble data assimilation applied to Hurricane Katrina (2005). 28th Conference on Hurricanes and Tropical Meteorology, Orlando, FL, April 2008.

Torn, R. D. and G. J. Hakim, 2007: Factors influencing downstream anti-cyclogensis during extratropical transition. 22nd Conference on Weather Analysis and Forecasting, Park City, UT, June 2007.

Torn, R. D., 2006: Initial condition sensitivities for Western Pacific extratropical transition events. 13th Cyclone Workshop, Monterey, CA, October 2006.

Torn, R. D., and G. J. Hakim, 2006: Ensemble analyses and predictions of Hurricane Katrina. 27th Conference on Hurricanes and Tropical Meteorology, Monterey, CA, April 2006.

Torn, R. D., 2006: Initial condition sensitivities for Western Pacific extratropical transition events. 27th Conference on Hurricanes and Tropical Meteorology, Monterey, CA, April 2006.

Torn, R. D., 2006: Using ensemble data assimilation to investigate the initial condition sensitivity of Western Pacific extratropical transitions. Ensemble Data Assimilation Workshop, Balcones Springs, TX, April 2006.

Torn, R. D., and G. J. Hakim, 2005: Real-time data assimilation at the University of Washington. 21st Conference on Weather Analysis and Forecasting/17th Conference on NWP, Washington DC, August 2005.

Torn, R. D., and G. J. Hakim, 2005: Real-time data assimilation at the University of Washington. Pacific Northwest Weather Workshop, Seattle, Washington, March 2005.

Torn, R. D., G. J. Hakim and C. Snyder, 2005: Boundary conditions for limited-area ensemble Kalman filters. 4th International Symposium on Assimilation of Observations in Meteorology and Oceanography, Prague, Czech Republic, April 2005.

Torn, R. D., G. J. Hakim, C. Snyder, 2004: Initial and boundary conditions for a limited area

ensemble Kalman filter. 16th Conference on Numerical Weather Prediction, Seattle, Washington, January 2004.

Torn, R. D., G. J. Hakim, C. Snyder, 2003: Boundary conditions for a limited area ensemble Kalman filter. Workshop on Ensemble Weather Forecasting in the Short to Medium Range, Val Morin, Quebec, Canada, September 2003.

Torn, R. D., J. R. Mecikalski, J. M. Norman, M. C. Anderson, S. J. Richardson, and J. A. Brotzke, 2002: Remote Estimates of Surface Energy Fluxes on the 30-meter Spatial Scale. 1st AMS Student Conference, Orlando, Florida, January 2002.

Torn, R. D. and G. N. Nathanson, 2001: Surface Segregation of butanol in sulfuric acid. 83rd Meeting of the American Chemical Society, Chicago, Illinois, August 2001.

DISSERTATION

Torn, R. D., 2007: Using Ensemble Data Assimilation for Predictability and Dynamics. Ph.D. Dissertation, Department of Atmospheric Sciences, University of Washington, 185 pp.

EDUCATION

Ph.D. Atmospheric Science, University of Washington, May 2007.
(Advisor: Prof. Gregory J. Hakim).

B.S. Atmospheric and Oceanic Sciences (with honors) and Mathematics, University of Wisconsin-Madison, May 2002.

OTHER EDUCATION

Participant in the 2003 NCAR Colloquium on Data Assimilation, National Center for Atmospheric Research, July 2003.