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Research Interests

My research centers on tropical meteorology and weather prediction, with an emphasis on developing methods that integrate observations and theory to enhance forecast skill over North America. Key areas of interest include the coupling between tropical convection and large-scale atmospheric circulation, tropical–extratropical interactions, and subseasonal-to-seasonal (S2S) prediction.

Education

Ph.D. in Mathematics and Atmospheric and Ocean Sciences, 2010
Courant Institute of Mathematical Sciences, New York University, New York, NY

M.S. in Applied and Computational Mathematics, 2005
Instituto de Matematica Pura e Aplicada (IMPA), Rio de Janeiro, Brazil

B.S. in Civil Engineering, 2003
Universidade de Sao Paulo, Sao Paulo, Brazil

Appointments

Chief, Atmosphere-Ocean Processes and Predictability Division
Supervisory Physical Scientist, Physical Sciences Laboratory, NOAA, 2024-present

Research Physical Scientist, Physical Sciences Laboratory, NOAA, 2019-2024

Research Scientist, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado at the NOAA Physical Sciences Laboratory, Boulder, 2014 - 2018.

Post-doctoral Fellow, NOAA Earth System Research Laboratory, Boulder CO (National Research Council Program & CIRES Postdoctoral Visiting Fellowships), 2010-2013

Professional Activities

World Meteorological Organization, Global Precipitation Experiment: member of Precipitation Modeling, Prediction, and Process Understanding working group (2025-2029)

US Climate Variability and Predictability Program (CLIVAR): co-chair of Process Study and Model Improvement Panel (2025 – 2027, member since 2023)

NOAA Precipitation Prediction Grand Challenge Implementation Team Membership (2024-present)

Organizer and Lecturer at Summer School on Theory, Mechanisms and Hierarchical Modelling of Climate Dynamics: Convection and Clouds International Centre for Theoretical Physics, Italy (2024)

NOAA Seasonal Forecast System Development Plan: team member (2023-present)

Fellow at the Transregional Collaborative Research Center “Waves to Weather”, Germany (2023)

NOAA Office of Oceanic and Atmospheric Research (OAR) CPO/MAPP Marine Ecosystems Task Force: co-lead (2020-2023)

AGU Journal of Advances in Modeling Earth Systems: Associate Editor (2018-2023)

Program chair for the American Meteorological Society (AMS) 8th & 9th Symposium on the Madden-Julian Oscillation and Sub-Seasonal Monsoon Variability (2020, 2021).

ATOMIC PSL NOAA Weather briefings organizer during the field campaign (Jan/Feb 2020)

AMS Conference on Atmospheric and Oceanic Fluid Dynamics (AOFD): committee member (2012 - 2019) and meeting organizer (2017 & 2019)

National Research Council (NRC): member of the review panel for the NRC graduate postdoctoral and visiting scientists' fellowships (2015 - 2019)

AMS Monthly Weather Review: Associate Editor (2013-2016).

Honors and Awards

QJRMS Editor's Award in recognition of a significant contribution to the journal or editorial process, 2014

National Research Council Research Associateship Award, 2011-2013.

Cooperative Institute for Research in Environmental Sciences Visiting Fellows Program, 2010-2011.

Dean's Dissertation Fellowship, NYU Graduate School of Arts and Sciences, 2009-2010.

Outstanding Oral Presentation, 17th Conf. on Atmospheric and Oceanic Fluid Dynamics, 2009.

Henry MacCracken Fellowship, NYU Graduate School of Arts and Sciences, 2005-2008.

IMPA Graduate Research Fellowship, Master Fellowship from CNPq (Brazilian Governmental Agency), 2003-2004.

Publications

Gehne, M. J. **Dias**, J. D. Scott, D. J. Amaya, M. G., Jacox, M. A. Alexander, A. Cluett: Influence of Atmospheric Errors on Weeks 2-4 California Current System predictions, (*Geophys. Res. Lett., submitted*)

Wolding, B., J. **Dias**, M. Gehne, G. Kiladis, F. Ahmed, K. Schiro, and A. Adames: Plume model assessment of the convective coupling of equatorial waves, (*J. Atm. Sci., in review*)

Hu, I-K, X. Chen, L. Bengtsson, E. J. Thompson, J. **Dias**, S. N. Tulich: Utilizing ATOMIC observations for assessing marine shallow cumuli in single column models (*JAMES, in review*)

Chen, X., J. **Dias**, B. Wolding, P. Blossey, C. DeMott, R. Pincus, and E. J. Thompson: Impacts of weak sea surface temperature warm anomalies on trade wind cloudiness in large eddy simulations, (*JAMES, accepted with minor revisions*)

Kiladis, G. N., J. R. Albers, and J. **Dias,** 2025: Dependence of the structure of stratospheric Kelvin and mixed Rossby-gravity waves on the basic state flow. *J. Atmos. Sci. (in press)*

Bengtsson, L., S. N. Tulich, J. **Dias**, B. Wolding, K.J.C. Hall, M. Gehne, G. N. Kiladis, and P. Pegion, 2025: The crucial role of the initial state in MJO prediction, (*Geophys. Res. Lett.*, *, 52, e2025GL115833*)

Dias, J., M. Gehne, G. Kiladis, B. Wolding, and A. Hoell, 2025: Robust multi-decadal variability of Madden-Julian Oscillation amplitude in 20th century. *Geophys. Res. Lett.*, **52**, e2024GL113303.

Amaya D. J., N. Maher, C. Deser, M. G .Jacox, M. A. Alexander, M. Newman, J. **Dias**, and J. Lou, 2025: Linking Projected Changes in Seasonal Climate Predictability and ENSO Amplitude, *J. Climate*, **38**, 675–688

Dias, J., Gehne, M., Kiladis, G. N., & Magnusson, L.,2023: The role of convectively coupled equatorial waves in sub-seasonal predictions. *Geophys. Res. Lett*, **50**, e2023GL106198.

Wolding, B., A. Rydbeck, J. **Dias**, F. Ahmed, M. Gehne, G. Kiladis, E. Riley Dellaripa, X. Chen, and I. McCoy, 2024: Atmosphere-Ocean Coupled Energy Budgets of Tropical Convective Discharge-Recharge Cycles. *J. Atmos. Sci.*, **81**, 3–29

Chen, X., J. **Dias**, B. Wolding, R. Pincus, C. DeMott, G. Wick, E. J. Thompson, and C. W. Fairall, 2023: Ubiquitous Sea Surface Temperature Anomalies Increase Spatial Heterogeneity of Trade-Wind Cloudiness on Daily Timescale. *J. Atmos. Sci* ,**80**, 2969–2987.

Cheng, Y.-M, J. **Dias**, G. N. Kiladis, Z. Feng, L. R. Leung, 2023: Mesoscale convective systems modulated by convectively coupled equatorial waves. *Geophys. Res. Lett.*, **50**, e2023GL103335.

Barpanda, P., S. N. Tulich, J. **Dias**, and G. N. Kiladis, 2023: The Role of Subtropical Rossby Waves in Amplifying the Divergent Circulation of the Madden–Julian Oscillation. *J. Atmos. Sci.*, **80**, 2377–2398

Bengtsson, L., L. Gerard, J. Han, M. Gehne, W. Li, and J. **Dias**, 2022: A Prognostic-Stochastic and Scale-Adaptive Cumulus Convection Closure for Improved Tropical Variability and Convective Gray-Zone Representation in NOAA's Unified Forecast System (UFS). *Mon. Wea. Rev.*, 150, 3211–3227,

Cheng, Y., S. Tulich, G. N. Kiladis, and J. **Dias**, 2022: Two Extratropical Pathways to Forcing Tropical Convective Disturbances. *J. Climate*, 35, 2987–3009

Gehne, M., B. Wolding, J. **Dias**, and G. N. Kiladis, 2022: Diagnostics of Tropical Variability for Numerical Weather Forecasts. *Wea. Forecasting*, 37, 1661–1680

Berrington, A. H., Sakaeda, N., **Dias**, J., & Kiladis, G. N. , 2022: Relationships between the eastward propagation of the Madden-Julian Oscillation and its circulation structure. *Journal of Geophysical Research: Atmospheres*, 127, e2021JD035806.

Knippertz, P., M. Gehne, G. N. Kiladis, K. Kikuchi, A.R. Satheesh, P. E. Roundy, G-Y Yang, N. Žagar, J. **Dias**, A. H. Fink, J. Methven, A. Schlueter, M. C. Wheeler, S. J. Woolnough, 2022: The Intricacies of Identifying Equatorial Waves. *QJRMS*.

Wang, S., Z. K. Martin, A. H. Sobel, M. K. Tippett, J. **Dias**, and G. N. Kiladis, 2022: A multivariate index for tropical intraseasonal oscillations based on seasonally-varying modal structures. *J. Geophys. Res.-Atmospheres*

Wolding, B., S.W. Powell, F. Ahmed, J. **Dias**, M. Gehne, G. N. Kiladis, 2022: Tropical Thermodynamic-Convection Coupling in Observations and Reanalyses. *J. Atmos. Sci*.

Hsiao, W-T, E. A. Barnes, E. Maloney, S. Tulich, J. **Dias** and G. Kiladis, 2022: Role of the Tropics and its Extratropical Teleconnections in State-Dependent Improvements of U.S. West Coast UFS Precipitation Forecasts. *Geophys. Res. Lett.*

Amaya D. J., M. G. Jacox, J. **Dias**, M. A. Alexander, K. B. Karnauskas, J. D. Scott & M. Gehne, 2022: Subseasonal-to-seasonal forecast skill in the California Current System and its connection to coastal Kelvin waves. *J. Geophys. Res.-Oceans.*

Dias, J., Tulich, S. N., Gehne, M., & Kiladis, G. N., 2021: Tropical Origins of Weeks 2–4 Forecast Errors during the Northern Hemisphere Cool Season, *Mon. Weather Rev*, *149*(9), 2975-2991.

Bengtsson, L., **Dias**, J., Tulich, S., Gehne, M., & Bao, J.-W., 2021: A stochastic parameterization of organized tropical convection using cellular automata for global forecasts in NOAA's Unified Forecast System. *Journal of Advances in Modeling Earth Systems*, 13, e2020MS002260.

Mayta, V. C., Kiladis, G. N., **Dias**, J., Silva Dias, P. L., & Gehne, M., 2021: Convectively Coupled Kelvin Waves over Tropical South America, *J.Climate*, *34*(16), 6531-6547.

Sakaeda, N., **Dias**, J and G. N. Kiladis, 2020: The Unique Characteristics and Potential Mechanisms of the MJO-QBO Relationship *J. Geophys. Res*.

Wolding, B., J. **Dias**, G. N. Kiladis, F. Ahmed, S.W. Powell, E. Maloney, and M. Branson, 2020: Interactions Between Moisture and Tropical Convection. Part I: The Co-Evolution of Moisture and Convection. *J. Atmos. Sci*., doi: 10.1175/JAS-D-19-0225.1.

Wolding, B., J. **Dias**, G. N. Kiladis, E. Maloney, and M. Branson, 2020: Interactions Between Moisture and Tropical Convection. Part II: The Convective Coupling of Equatorial Waves. *J. Atmos. Sci*., doi:10.1175/JAS-D-19-0226.1.

Sakaeda, N., G. N. Kiladis and J. **Dias**, J., 2020: The Diurnal Cycle of Rainfall and the Convectively-Coupled Equatorial Waves over the Maritime Continent. *J. Climate*.

Bengtsson, L., J. **Dias**; M. Gehne, P. Bechtold, J. Whitaker, J.-W. Bao, L. Magnusson, S. Michelson, P. Pegion; S. Tulich; G. N. Kiladis, 2019: Convectively coupled equatorial wave simulations using the ECMWF IFS and the NOAA GFS cumulus convection schemes in the NOAA GFS model. *Mon. Weather Rev.*, 147, 4005-4025.

Dias J. and G. N. Kiladis, 2019: The Influence of Tropical Forecast Errors on Higher Latitude Predictions. *Geophys. Res. Lett.,* 46, 4450-4459

Kim, Y. -H., G. N. Kiladis, J. R. Albers, J. **Dias**, M. Fujiwara, J. W. Anstey, I. -S. Song, C. J. Wright, Y. Kawatani, F. Lott, and C. Yoo, 2019: Comparison of equatorial wave activity in the tropical tropopause layer and stratosphere represented in reanalysis. *Atmos. Chem. Phys.,*19, 10027–10050.

Dias, J., M. Gehne, G. N. Kiladis, N. Sakaeda, P. Bechtold, and T. Haiden, 2018: Equatorial waves and the skill of NCEP and ECMWF numerical weather prediction systems. *Mon. Wea. Rev.*, 146(6):1763-1784.

Sakaeda N., S. W. Powell, **J. Dias**, G. N. Kiladis: The Diurnal Variability of Precipitating Cloud Populations during DYNAMO, 2018. *J. Atmos. Sci.*, 75(4):1307-1326.

Dole R. and Co-authors, 2018: Advancing Science and Services during the 2015-16 El Nino: The NOAA El Nino Rapid Response Field Campaign. *Bull. Amer. Meteor. Soc.,* 99, 975-1001.

Albers, J. R., J. Perlwitz, A. H. Butler, T. Birner, G. N. Kiladis, Z. D. Lawrence, G. L. Manney, A. O. Langford, and J. **Dias**, 2018. Mechanisms governing interannual variability of stratosphere-to- troposphere ozone transport. *J. Geophys. Res: Atmospheres*, 123(1):234-260.

Dias, J., N. Sakaeda, G. N. Kiladis, and K. Kikuchi, 2017: Influences of the MJO on the space-time organization of tropical convection. *J. Geophys. Res.: Atmospheres*., 122 8012–8032

Kikuchi, K., G. N. Kiladis, J. **Dias**, and T. Nasuno, 2017: Convectively coupled equatorial waves during CINDY/DYNAMO: Slow Kelvin waves as building blocks. *Clim. Dyn*.,1–20.

Sakaeda, N., G. N. Kiladis, and J. **Dias**, 2017: The diurnal cycle of tropical cloudiness and rainfall associated with the Madden-Julian Oscillation. *J.Climate*, 30, 3999–4020.

Kiladis, G. N., J. **Dias**, and M. Gehne, 2016: The Relationship between equatorial Mixed Rossby-gravity and Eastward Inertio- Gravity waves: Part 1. *J. Atmos. Sci*., 73, 2123–2145.

Dias, J and G. N. Kiladis, 2016: The Relationship between equatorial Mixed Rossby- gravity and Eastward Inertio- Gravity waves: Part 2. *J. Atmos. Sci*., 73, 2147–2163.

Albers J. R., T. Birner, G. N. Kiladis and J. **Dias**, 2016: Tropical Upper-Tropospheric Potential Vorticity Intrusions during Sudden Stratospheric Warmings. *J. Atmos. Sci*., 73, 2361–2384.

Dias, J., and G. N. Kiladis, 2014: Influence of the basic state zonal flow on convectively coupled equatorial waves. *Geophys. Res. Lett*., 41,

Kiladis, G. N., J. **Dias**, K. H. Straub, M. C. Wheeler, S. N. Tulich, K. Kikuchi, K. M. Weickmann, and M. J. Ventrice, 2014: A comparison of OLR- and circulation-based indices for tracking the MJO. *Mon. Wea. Rev*., 142, 1697–1715.

Dias, J., P. L. Silva Dias, G. N. Kiladis and M. Gehne, 2013. Modulation of shallow water equatorial waves due to a varying equivalent height background*. J. Atmos. Sci*., 70, 2726–2750.

Dias, J., S. Leroux, S. N. Tulich, and G. N. Kiladis, 2013. How systematic is organized tropical convection within the MJO? *Geophys. Res. Lett*., 40, 1420– 1425

Silva Dias, M. A. F., J. **Dias**, L. M. V. Carvalho, E. D. Freitas and P. L. Silva Dias, 2012. Changes in extreme daily rainfall for Sao Paulo, Brazil. *Climatic Change*, 1–18.

Dias, J., S. N. Tulich, and G. N. Kiladis, 2012. An object-based approach to assessing tropical convection organization. *J. Atmos. Sci*., 69, 2488–2504.

Pauluis, O. and J. **Dias**, 2012. Satellite estimates of precipitation-induced dissipation in the atmosphere. *Science*, 335 (6071), 953–956.

Dias, J. and O. Pauluis, 2011. Modulations of the phase speed of Convectively Coupled Kelvin Waves by the ITCZ. *J. Atmos. Sci*., 68 (7), 1446–1459.

Dias, J. and O. Pauluis, 2010. Impacts of convective life-time on moist geostrophic adjustment. *J. Atmos. Sci*., 67 (9), 2960–2971.

Dias J, and O. Pauluis O., 2009. Convectively Coupled Waves Propagating along an Equatorial ITCZ. *J. Atmos. Sci.,* 66 (8), 2237–2255.