

Aneesh C. Subramanian

Atmospheric and Oceanic Sciences
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Academics

Research Interests Weather and Climate Predictability, Climate Dynamics, Air-Sea interaction, Atmospheric Convection, Data Assimilation in Geophysical models.

Education

Ph. D. 2012, Climate Research Division, Scripps Institution of Oceanography, UCSD
Research Field: Madden-Julian Oscillations, Data assimilation and inverse methods in ocean state estimation.
Research Supervisors: Dr. Arthur J. Miller and Dr. Bruce Cornuelle
Dissertation: *Multiscale dynamics of atmospheric and oceanic variability in the climate system.*
Courses done: Mathematical Methods for Differential Equations, Geophysical Fluid Dynamics, Ocean Waves, Climate Dynamics, Numerical Optimization

M.Sc.(Engg.) 2006, Center for Atmospheric and Oceanic Science, I.I.Sc., India
Dissertation: *Data assimilation experiment using an Indian Ocean General Circulation Model.*

B.Tech 2004, Indian Institute of Technology (IIT) - Madras.
Discipline: Engineering.

Positions Held

2019 - present Asst. Professor, Atmospheric and Oceanic Sciences, University of Colorado Boulder
2019 - present Visiting Scientist, CW3E, Scripps Institution of Oceanography
2017 - 2018 Project Scientist, Climate Research Division, Scripps Institution of Oceanography
2017 - present Visiting Scientist, Physics Department, Oxford University
2014 - 2017 ERC Post-doctoral Researcher and Lecturer, Physics Department, Oxford University
2014 - 2017 Visiting Scientist, Climate Research Division, Scripps Institution of Oceanography
2013 - 2014 Adjunct faculty, Department of Mathematics and Statistics, San Diego State University
2012 - 2014 Post-doctoral Scholar, Climate Research Division, Scripps Institution of Oceanography
2006 - 2012 Research Assistant, Climate Research Division, Scripps Institution of Oceanography

Current and past work

- Stochastic and probabilistic earth system modeling for climate prediction
- Inverse ocean modeling in the Peruvian Current and California Current region using ROMS and MITGCM, a regional ocean model
- Inverse methods for data assimilation in nonlinear problems
- MJO dynamics and coupled ocean-atmospheric processes in the Indian Ocean region using GCMs
- Investigation of the MJO initiation in the Indian Ocean and predictability skill using the NCAR CAM and the DYNAMO observations.

Teaching and

Supervising experience

- at CU Boulder** [2019] Taught "ATOC 4500 - Climate Modeling" and "ATOC 1050: Weather & the Atmosphere".
- at CU Boulder** [2019] Fellow of CU Boulder NSF-sponsored Active Learning Academy (ALA) and completed the "Learning by Design" Program in Fall 2019.
- at CU Boulder** [2019] FTEP Workshop, Teaching Large Classes (4 Feb 2019). Open Educational Resources (OER) Workshop (5 Apr 2019).
- at UCSD** [2017] Guest Lecturer for SIO 209 (Numerical Modeling of Climate System). Primary instructor: Ian Eisenman.
- at UCSD** Supervising SIO post-doctoral scholar, Dr. Rui Sun. Member of Ph. D. thesis committee for doctoral candidates, Mr. Jonathan Eliashiv and Ms. Nathali Cordero Quiros. Mentor for under-graduate student, Ms. Yingxuan Liu in the Faculty Mentor Program @ UCSD.
- at Oxford Univ.** [2016] Lecturer for Third year undergrad course on Physical Oceanography in the Michaelmas term.
- at Oxford Univ.** [2016] Evaluator of MPhys projects in the Department of Physics at the University of Oxford, Co-supervisor of a Summer Project [Andrew Orkney, 3rd yr Earth Sciences, Oxford Univ.]. Was awarded £2000 from the U.K. Met Office Academic Partnership for the Summer Project proposal.
- at Oxford Univ.** [2014, 2015] Tutor in the "Physics of the Atmosphere and Oceans" course for senior undergraduates and first year graduate students in Physics.
- at Oxford Univ.** [2015] Supervisor of a Summer Project [Ben Huddart, 3rd yr Physics, Cambridge Univ.] and a MPhys Masters' Thesis Project [Mark Hortop, MPhys, Univ. of Oxford] in the Department of Physics at the University of Oxford. Was awarded £2000 from the U.K. Met Office Academic Partnership for the Summer Project proposal.
- at UCSD** [2013] The College Classroom, a CIRTl certification course on evidence-based teaching practices that support student learning.
- at UCSD** [Winter (2008, 2009, 2011)] TA for an undergraduate class "Solid and Fluid Earth"
- at IIT Madras** [2000-2001] Teaching students of primary school as a volunteer of National Service Scheme.

Academic Services

- **Chair of Scientific Organizing Committee** for the US CLIVAR Workshop "Translating Process Understanding to Improve Climate Models" (2015)
- **Associate Editor**, Atmospheric Science Letters (Royal Meteorological Soc.), 2015-present
- **Member and Co-Chair since 2019** of the US CLIVAR Phenomena, Observations and Synthesis (POS) Panel (2017-2021)
- **Member** of DOE Review Panel (2017); NOAA proposal review panel (2018)
- **Member** of the NOAA MAPP S2S Task Force
- **Session Chair** for the AGU Fall Meeting (2017, 2016), Ocean Sciences Meeting (2016)
- **Member** of the CPT Review Committee of the US CLIVAR PSMI Panel (2014)
- **Member** of the US CLIVAR Process Studies and Model Improvement (PSMI) Panel (2013-2016)
- **Co-convener** of mini-symposium on "Quantifying and Accounting for Uncertainties in Large Scale Models" at the SIAM 2016 UQ Meeting, Lausanne, Switzerland.
- **Co-convener** of mini-symposium on "Uncertainty Quantification in Climate and Weather Models" at the SIAM 2013 Annual Meeting, San Diego.
- **Member** of SIO Computing Committee - 2009,2010,2011

- **Student member** of SIO faculty search committee - 2007, 2011
- **Member** of National Ocean Science Bowl (San Diego Chapter) organizing team - 2008
- **Reviewer** for Journal of Climate, Atmospheric Science Letters, IPCC AR5 Report, Journal of Geophysical Research, International Journal of Geographical Information Science, Advances in Atmospheric Sciences, Ocean Modeling, Journal of Advances in Modeling Earth Systems, Earth and Planetary Science Letters, Tellus A, Journal of Atmospheric Sciences, IEEE Access.
- **Reviewer** for NSF (2).

Academic Services at CU Boulder

- **ATOC Department Representative** for the NSF PRIMERS CUB: (2019-2024): NSF-funded project to enhance and reform STEM Education
- **Committee membership in ATOC** Admissions committee, Technology committee
- **Faculty Reviewer** for CU Boulder Undergraduate Research Opportunities Program.

Academic Honours

- Member of AMS Early Career Leadership Academy 2019
- Best Team in visualization of weather forecasts Award, ECMWF Users Meeting, 2017
- Best Student Presentation Award, WCRP Open Science Conference 2011, Denver, Colorado
- Best Teaching Assistant Award 2011, Scripps Institution of Oceanography
- SUNNY Scripps-NCAR Graduate Student Fellowship (2009-2011)
- NCAR ASP Summer Fellowship (2008, 2012)
- NSF (2009), JCSDA(2009), GODAE(2010) and WMO(2011) travel grants to attend workshops on Climate Research, Data Assimilation and Ocean Mesoscale eddies.
- National Talent Scholar for 6 years(1998-2004)
- Top 1% of the 100,000 people who wrote the Joint Entrance Examination for entry into IIT.
- MATHWORLD Scholarship in HighSchool (1996-1998)

Professional Societies

- Member of AGU, AMS, SIAM
- Member of SAMSI, Mathematics and Climate Research Network, CliMathNet.

Funded grants

- **Improved Understanding of air-sea interaction processes and biases in the Tropical Western Pacific using observation sensitivity experiments and global forecast models** (2018-2020). PI for NOAA grant

- **Understanding and Quantifying the Predictability of Marine Ecosystem Drivers in the California Current System** (2017-2021). co-PI for NOAA grant
- **Prediction of Monsoon Intra-Seasonal Oscillations using high-resolution coupled modeling and data-assimilation** (2017-2022). PI for ONR grant
- **Virtual Red Sea Initiative** (2017-2019). co-PI for KAUST grant
- **A Nudging and Ensemble Forecasting Approach to Identify and Correct Tropical Pacific Bias-Producing Processes in CESM** (2014-2018). PI for NOAA grant
- **EASM-3: Collaborative Research: Quantifying Predictability Limits, Uncertainties, Mechanisms, and Regional Impacts of Pacific Decadal Climate Variability.** (2014-2018). Co-PI for NSF grant
- **Assessing the Impact of Diurnal Wind Variability** (2014-2018). Co-I for NASA grant
- **Particle Kalman Filtering for Ocean State Estimation** (2007-2009). Supplied key ideas and substantial text for ONR grant
- **Coupled Ocean-Atmosphere Dynamics and Predictability of Madden-Julian Oscillations** (2010-2014) Supplied key ideas and preliminary research results for ONR grant

Publications

Please refer to my homepage for most up-to-date list of publications

In review

- Meehl, G., et al., **A. C. Subramanian** (2019): Initialized Earth system prediction from subseasonal to decadal timescales, *Nature Reviews*, sub judice.
- Lavers, D., N. B. Ingleby, **A. C. Subramanian**, D. Richardson, F. M. Ralph, J. D. Doyle, C. Reynolds, R. D. Torn, M. J. Rodwell, V. Tallapragada, F. Pappenberger, (2019): Forecast Errors and Uncertainties in Atmospheric Rivers, *Weather and Forecasting*, sub judice
- Ralph, M. F., Cannon, F., Tallapragada, V., Davis, C. A., Doyle, J. D., Pappenberger, F., **Subramanian, A. C.**, Wilson, A. M., Lavers, D. A., Reynolds, C. A., Haase, J. S., Centurioni, L., Rutz, J., Cordeira, J.M., Zheng, M., Hecht, C. W., Kawzenuk, B., Monache, L. D., (2019): West Coast Forecast Challenges and Development of Atmospheric River Reconnaissance, *BAMS*, sub judice.
- Gagne, D. J., H. Christensen, **A. C. Subramanian**, A. Monahan (2019): Machine Learning for Stochastic Parameterization: Generative Adversarial Networks in the Lorenz '96 Model, *JAMES*, sub judice
- Raboudi, N. F., B. Ait-El-Fquih, **A. C. Subramanian**, and I. Hoteit (2019): Enhancing Ensemble Data Assimilation into One-Way-Coupled Models with One-Step-Ahead-Smoothing, *QJRMS*, sub judice
- Jacox, M.G., M. A. Alexander, S. Siedlecki, K. Chen, Y.-O. Kwon, S. Brodie, I. Ortiz, D. Tommasi, M. J. Widlansky, D. Barrie, A. Capotondi, W. Cheng, E. Di Lorenzo, C. Edwards, J. Fiechter, P. Fratantoni, E. L. Hazen, A. J. Hermann, A. Kumar, A. J. Miller, D. Pirhalla, M. Pozo Buil, S. Ray, S. C. Sheridan, **A. Subramanian**, P. Thompson, L. Thorne, H. Annamalai, S. J. Bograd, R. B. Griffis, H. Kim, A. Mariotti, M. Merrifield and R. Rykaczewski, (2019): Seasonal-to-interannual prediction of U.S. coastal marine ecosystems: Forecast methods, mechanisms of predictability, and priority developments. *Progress in Oceanography*, sub judice.

Published

49. Gopal, G., **A. C. Subramanian**, A. J. Miller, H. Seo, D. Sengupta, 2019: Estimation and Prediction of the Upper Ocean Circulation in the Bay of Bengal, *Deep Sea Research II*, In Press.
48. Eliashiv, J., **A. C. Subramanian**, A. J. Miller, 2019: A Reliability Budget analysis of CESM-DART, *JAMES*, In Press.

47. Eliashiv, J., **A. C. Subramanian**, A. J. Miller, 2019: Tropical climate variability in Community Earth System Model and the Data Assimilation Research Testbed, *Clim. Dyn.*, In Press.
46. DeFlorio, M. J., D. E. Waliser, F. M. Ralph, B. Guan, A. Goodman, P. B. Gibson, S. Asharaf, L. Delle Monache, Z. Zhang, **A. C. Subramanian**, F. Vitart, H. Lin, and A. Kumar 2019: Experimental subseasonal-to-seasonal (S2S) forecasting of atmospheric rivers over the western United States, *Journal of Geophysical Research - Atmospheres*, In Press.
45. Chapman, W., A. Subramanian, Monache, L.D., and M. Ralph, 2019: Improving atmospheric river forecasts with machine learning. *Geophys. Res. Lett.*, In Press.
44. Villas Boas, A. B., Arduin, F., et al., **A. C. Subramanian**, 2019: Wind/Current/Waves Interactions. *Frontiers in Marine Science*, In Press.
43. Hermes, J. C., Vialard, J., et al., **A. C. Subramanian**, 2019: Sustained Indian Ocean Observing System. *Frontiers in Marine Science*, In Press.
42. Capotondi, A., et al., **A. C. Subramanian**, 2018: Observational Needs: Marine Ecosystem Modeling and Forecast. *Frontiers in Marine Science*, In Press.
41. Haustein, K., V. Venema, K. Cowtan, Z. Hausfather, R.G. Way, F.E.L. Otto, B. White, P. Jacobs, , **A. C. Subramanian**, A.P. Schurer, 2018: A limited role for unforced internal variability in 20th century warming. , In Press.
40. **Subramanian, A. C.**, et al., 2018: Ocean observations to improve our understanding, modeling and forecasting of subseasonal-to-seasonal variability. *Frontiers in Marine Science*, In Press.
39. Penny, S. G., et al., **A. C. Subramanian**, 2018: Observational Needs for improving Ocean and Coupled Reanalysis, S2S Prediction, and Decadal Prediction. *Frontiers in Marine Science*, In Press.
38. Sun, R., **A. C. Subramanian**, A. J. Miller, M. Mazloff, I. Hoteit, and B. D. Cornuelle 2018: A regional coupled oceanatmosphere modeling framework (MITgcmWRF) using ESMF/NUOPC: description and preliminary results for the Red Sea, *Geo. Mod. Dev. Disc.*, In Press.
37. Cordero-Quirs, N., A. J. Miller, **A. C. Subramanian**, J. Y. Luo 2018: A composite physical-biological ENSO in the California Current System, *Ocean Modelling*, In Press.
36. Seo, H., **Subramanian, A. C.**, Song, H., Chowdary, J. S., 2019: Coupled effects of ocean current on wind stress in the Bay of Bengal: Eddy energetics and upper ocean stratification, *Deep Sea Research II*, In Press.
35. Capotondi, A., P. D. Sardeshmukh, E. Di Lorenzo, **A. C. Subramanian**, A. J. Miller, 2019: How Important is ENSO for the Predictability of US West Coast Ocean Temperatures?, *Sci. Rep.*, In Press
34. Rodrigues, R., **A. C. Subramanian**, L. Zanna, 2019: Decadal ENSO bimodality and extremes, *Geo. Res. Let.*, In Press.
33. Eddebbar, Y., K. Rodgers, M. Long, **A. C. Subramanian**, S-P. Xie, and R. Keeling, 2018: El Nio-like Physical and Biogeochemical Ocean Response to Tropical Eruptions, *J. Clim.*, In Press.
32. **Subramanian, A. C.**, S. Juricke, P. Dueben, T. N. Palmer, 2018: A Stochastic Representation of Sub-Grid Uncertainty for Dynamical Core Development. *BAMS*, In Press.
31. Zhan P., G. Gopalakrishnan, **A. C. Subramanian**, D. Guo, I. Hoteit, 2018: Adjoint Sensitivity Studies of the Red Sea Eddies. *JGR Oceans*, <https://doi.org/10.1029/2018JC014531>, In Press.
30. Guirguis, K., A. Gershunov, R. E.S. Clemesha, T. Shulgina, **A. C. Subramanian**, and F. M. Ralph, 2018: Circulation drivers of Atmospheric Rivers at the North American West Coast, *Geo. Res. Let.*, <https://doi.org/10.1029/2018GL079249>, In Press.
29. Leung, K., **A. C. Subramanian**, S. S. P. Shen, 2018: Statistical Characteristics of the Long-term High-Resolution Data of Darwin Precipitable Water Vapor. *AADA*, In Press.

28. Shields, C, et al., **A. C. Subramanian**, 2018: Atmospheric River Tracking Method Intercomparison Project (ARTMIP): Project Goals and Experimental Design. *Geo. Mod. Dev. Disc.*, 11(6), pp.2455-2474.
27. Dias, D. F., **A. C. Subramanian**, L. Zanna, A. J. Miller, 2018: Remote and Local Influences in Forecasting Pacific SST: a Linear Inverse Model and a Multimodel Ensemble Study. *Cli. Dyn.*, <https://doi.org/10.1007/s00382-018-4323-z>, In Press.
26. **Subramanian, A. C.**, F. Vitart, C. Zhang, A. Kumar and M. A. Balmaseda, 2017: Indian Ocean observations for operational subseasonal and seasonal forecasts. (Invited Book Chapter), *Indian Ocean Observations System*, WMO Publ., In Press.
25. Hatfield, S. E., **A. C. Subramanian**, P. Düben, T. N. Palmer, 2017: Improving weather forecast skill through reduced precision data assimilation. *Mon. Wea. Rev.*, 146(1), pp.49-62.
24. I-S. Kang, M-S. Ahn, H. Miura, **A. C. Subramanian**, 2017: GCMs with Full Representation of Cloud Microphysics and Their MJO Simulations, (Book Chapter), "*The gap between weather and climate forecasting: sub-seasonal to seasonal prediction*", Eds. F. Vitart and A. Robertson, Elsevier.
23. S. G. Penny, S. Akella, O. Alves, C. Bishop, M. Buehner, M. Chevallier, F. Coumillon, C. Draper, S. Frolov, Y. Fujii, A. Karspeck, A. Kumar, P. Laloyaux, J-F. Mahfouf, M. Martin, M. Pea, P. de Rosnay, **A. C. Subramanian**, R. Tardif, Y. Wang, X. Wu, 2017: Coupled Data Assimilation for Integrated Earth System Analysis and Prediction: Goals, Challenges, and Recommendations. *WMO Whitepaper*.
22. Giglio, D., S. Gille, **A. C. Subramanian**, S. Nguyen, 2017: The role of wind gusts in upper ocean diurnal variability. *JGR-Oceans*, 122(9), pp.7751-7764.
21. Leutbecher, M., et al., **A. C. Subramanian** 2017: Stochastic representations of model uncertainties at ECMWF: State of the art and future vision. *Quarterly Journal of the Royal Meteorological Society*, 143(707), pp.2315-2339.
20. Ummenhofer, C. C., **A. C. Subramanian**, and S. Legg (2017), Maintaining momentum in climate model development, *Eos*, 98, <https://doi.org/10.1029/2017EO086501>.
19. **Subramanian, A. C.**, T. N. Palmer, 2017: Ensemble superparameterization vs stochastic parameterization: A comparison of model uncertainty representation in tropical weather prediction. *Journal of Advances in Modeling Earth Systems*, 9, doi:10.1002/2016MS000857..
18. Düben, P., **A. C. Subramanian**, A. Dawson, T. N. Palmer, 2016: A study of reduced numerical precision to make superparametrisation more competitive. *Journal of Advances in Modeling Earth Systems*, 9, 566584, doi:10.1002/2016MS000862.
17. Davini, P., J. von Hardenberg, S. Corti, H. H. Christensen, S. Juricke, **A. C. Subramanian**, P. A. G. Watson, A. Weisheimer, T. N. Palmer, 2017: Climate SPHINX: evaluating the impact of resolution and stochastic physics parameterisations in climate simulations. *Geoscientific Model Development*, 10, 1383-1402, doi:10.5194/gmd-10-1383-2017.
16. **Subramanian, A. C.**, A Giannini, M Holland, S Legg, A Mahadevan, J Teixeira and C Ummenhofer, D Perovich, J Small and L Thompson, 2016: Translating Process Understanding to Improve Climate Models. *CLIVAR Special Report 2016-3* , 48pp., doi:10.5065/D63X851Q.
15. **Subramanian, A. C.**, A. Weisheimer, T. N. Palmer, P. Bechtold, F. Vitart, 2016: Impact of stochastic physics on tropical precipitation and climate variability in the ECMWF IFS. *Quarterly Journal of the Royal Meteorological Society*, In Press.
14. Huddart, B. M., **A. C. Subramanian**, L. Zanna, T. N. Palmer, 2016: Seasonal and Decadal forecasts of Atlantic SST using a Linear Inverse Model. *Climate Dynamics*, In press.
13. Zhan, P., **A. C. Subramanian**, F. Yao, A. Kartadikaria, D. Guo, I. Hoteit, 2016: Eddy Energy Sources and Sinks in the Red Sea. *JGR-Oceans*, 121, 4732-4747.
12. Leung, K., M. Velado, **A. C. Subramanian**, G. J. Zhang, R. C.J. Somerville and Shen, S. S. P., 2016: Simulation of high-resolution precipitable water data by a stochastic model with a random trigger. *AADA*, In press.

11. Seo, H., **A. C. Subramanian**, A. J. Miller, and N. R. Cavanaugh, 2014: Coupled impacts of the diurnal cycle of sea surface temperature on the Madden-Julian Oscillation. *Journal of Climate*, *27*, 8422-8443.
10. **Subramanian, A. C.**, G. J. Zhang, 2014: Diagnosing MJO forecast biases in NCAR CAM3 using nudging during the DYNAMO field campaign. *JGR: Atmospheres*, *119*, 7231-7253.
9. Zhan, P., **A. C. Subramanian**, F. Yao, and I. Hoteit, 2013: Eddies in the Red Sea: A statistical and dynamical study. *JGR-Oceans*, *119* (6), 3909-3925.
8. Cavanaugh, N. R., T. Allen, **A. C. Subramanian**, B. Mapes and A. J. Miller, 2013: The skill of tropical Linear Inverse Models in hindcasting the Madden-Julian Oscillation. *Climate Dynamics*, *44*, 897-906.
7. Miller, A. J. , Song, H., **Subramanian, A. C.**, 2013: The physical oceanographic environment during the CCE Years: Changes in climate and concepts. *Deep-Sea Research II*, *112*, 6-17.
6. Song, H., I. Hoteit, B. D. Cornuelle and **A. C. Subramanian**, 2013: An adjoint-based adaptive ensemble kalman filter, *Mon. Wea. Rev.*, *141*, 3343-3359
5. **Subramanian, A. C.**, M. Jochum, A. J. Miller, R. Neale, H. Seo, D. Waliser, and R. Murtugudde, 2012: The MJO and Global warming: A study in CCSM4 , *Climate Dynamics*, *42*, 2019-2031.
4. **Subramanian, A. C.**, A. J. Miller, B. D. Cornuelle, E. di Lorenzo, B. Weller and F. Straneo, 2013: A data assimilative perspective of oceanic mesoscale eddy evolution during VOCALS-REx. *Atmospheric Chemistry and Physics (VOCALS Special Issue)*, *13*, 3329-3344
3. **Subramanian, A. C.**, I. Hoteit, B. D. Cornuelle, A. J. Miller and H. Song, 2012: Linear versus Nonlinear Filtering with Scale-Selective Corrections for Balanced Dynamics in a Simple Atmospheric Model. *Journal of the Atmospheric Sciences*, *69*, 3405-3419
2. **Subramanian, A. C.**, M. Jochum, A. J. Miller, R. Murtugudde, R. Neale, D. Waliser, 2011: The Madden-Julian Oscillation in CCSM4, *J. of Climate* *24*, 6261-6282
1. Song, H., I. Hoteit, B. D. Cornuelle and **A. C. Subramanian**, 2010: An adaptive approach to mitigate background covariance limitations in the ensemble Kalman Filter, *Mon. Wea. Rev.* *138*, 2825-2845

Grey Literature

(Not Peer Reviewed)

- Capotondi, A., K. B. Karnauskas, A. Miller, and **A. C. Subramanian**, (2017) ENSO diversity and its implications for U.S. West Coast marine ecosystems. US CLIVAR Variations, Winter 2017, Vol. 15, No. 1. In Press.

Manuscripts

- **Subramanian, A. C.**, A. Weisheimer, T. N. Palmer, P. Bechtold, F. Vitart, F. Vana, M. Khairoutdinov, 2018: Subseasonal forecast skill in the ECMWF forecast system using ensemble superparameterization. *Quarterly Journal of the Royal Meteorological Society*, (*In Prep.*).
- **Subramanian, A. C.**, M. Mazloff, G. Gopalakrishnan, B. D. Cornuelle, 2017: Analysis of the California Undercurrent in an ocean state estimate, (*In Prep.*)
- **Subramanian, A. C.**, K. C. Armour, I. Hoteit, B. D. Cornuelle, 2018: Uncertainty on Transient Climate Sensitivity using nonlinear filters. (*In Prep.*)

Conferences & Talks

Invited Talks

- Subramanian, A. C. 2019: **Stochastic and Multi-scale Modeling for a seamless prediction across scales**, *American Mathematical Society Meeting (Sept 2019)*
- Subramanian, A. C. 2018: **Exploring Stochastic and Multi-scale Modeling for extreme weather prediction**, *AGU Fall Meeting (Dec 2018)*
- Subramanian, A. C. 2018: **Exploring Stochastic and Multi-scale Modeling for seamless prediction**, *Lawrence Berkeley National Laboratory (July 2018)*
- Subramanian, A. C., 2018: **Indian Ocean observations for operational subseasonal-to-seasonal prediction**, *CLIVAR IndOOS Review (Mar 2018)*
- Subramanian, A. C., 2017: **Subseasonal-to-seasonal prediction of atmospheric rivers**, *Winter Outlook Workshop (Nov 2017)*
- Subramanian, A. C., 2017: **Air-Sea interaction and theory of Monsoon Intraseasonal Oscillations**, *MISO-BOB WHOI Meeting (July 2017)*
- Subramanian, A. C., 2017: **Ensemble super-parameterization for subseasonal-to-seasonal prediction**, *JpGU-AGU Annual Meeting (May 2017)*
- Subramanian, A. C. 2017: **Stochastic Multi-scale Modeling for weather and climate prediction**, *University of Reading (February 2017)*
- Subramanian, A. C., Tim Palmer, Frederic Vitart, Antje Weisheimer, Peter Bechtold, 2016: **Stochastic multi-scale modeling for subseasonal-to-seasonal prediction**, *S2S Extremes Workshop, Columbia University, NY (Dec 2016)*
- Subramanian, A. C. 2016: **Stochastic Multi-scale Modeling for weather and climate prediction**, *Woods Hole Oceanographic Institution (July 2016)*
- Subramanian, A. C., Stephan Juricke, Peter Düben, Tim Palmer 2016: **Proposal for the Intercomparison of GCM Dynamical Cores with Stochastic Perturbations**, *Dynamical Core Model Intercomparison Project (June 2016)*
- Subramanian, A. C., Tim Palmer 2016: **Stochastic Multi-scale Modeling for weather and climate prediction**, *SIAM Conference on Uncertainty Quantification issues in the Geosciences (Apr 2016)*
- Subramanian, A. C. 2015: **Stochastic Multi-scale Modeling for weather and climate prediction**, *University of Washington (October 2015)*
- Subramanian, A. C., Tim Palmer 2015: **Towards the Prototype Probabilistic Earth-System Model for Climate Prediction**, *SIAM Conference on Mathematical and Computational issues in the Geosciences (June 2015)*
- Subramanian, A. C. 2015: **Impact of stochastic- and super-parameterisation of convection on precipitation in the ECMWF model**, *Stochastic Parametrisation Workshop (Mar 2015)*

Presentations

- Subramanian, A. C., Miller, A. J., Seo, H., Vitart, F., Gopalakrishnan, G. 2018: **Ocean data assimilation and Monsoon intraseasonal oscillation predictions**, *MISO-BOB Annual Meeting, Seattle, WA (Nov. 2018)*
- Subramanian, A. C., Miller, A. J., Seo, H., Vitart, F., Gopalakrishnan, G. 2018: **Impact of ocean data assimilation on Monsoon intraseasonal oscillation predictions**, *AGU Ocean Sciences Meeting, Portland (Feb. 2018)*
- Subramanian, A. C., Matsueda, M., Lavers, D., Palmer, T. N., Vitart, F., Ralph, M. R. 2017: **Evaluating sub-seasonal skill in probabilistic forecasts of Atmospheric Rivers and associated extreme events**, *AGU Fall Meeting, New Orleans (Dec. 2017)*

- **Subramanian, A. C.**, Palmer, T. N., Frederic Vitart, Antje Weisheimer, Peter Bechtold, 2016: **Stochastic multi-scale modeling for subseasonal-to-seasonal prediction**, *AGU Fall Meeting, San Francisco (Dec. 2016)*
- **Subramanian, A. C.**, David Lavers, Mio Matsueda, Tim Palmer 2016: **Stochastic Multi-scale Atmospheric Modeling for Weather Forecasting: An Atmospheric River Case Study**, *International Atmospheric Rivers Conference (August 2016)*
- **Subramanian, A. C.**, Tim Palmer, Marat Khairoutdinov, Frederic Vitart, Antje Weisheimer, Peter Bechtold, 2016: **Stochastic Multi-scale Modeling for weather and climate prediction**, *HDCP2 Conference on Convection and Precipitation, Berlin (Feb 2016)*
- **Subramanian, A. C.**, Tim Palmer, Marat Khairoutdinov, Frederic Vitart, Antje Weisheimer, Peter Bechtold, 2015: **Stochastic Multi-scale Modeling for weather and climate prediction**, *US CLIVAR Climate Process Team workshop, GFDL, Princeton, U.S.A. (Oct 2015)*
- **Subramanian, A. C.**, Sarah Gille, San Nguyen, 2015: **Modeling of diurnal variability in upper ocean processes using satellite and in-situ observations**, *US CLIVAR Climate Process Team workshop, GFDL, Princeton, U.S.A. (Oct 2015)*
- **Subramanian, A. C.**, Peter Bechtold, Antje Weisheimer, Frederic Vitart, Marat Khairoutdinov, Tim Palmer 2015: **Impact of stochastic- and super-parameterisation of convection on precipitation in the ECMWF model**, *EGU General Assembly (Apr 2015)*
- **Subramanian, A. C.** 2014: **Diagnosing MJO hindcast biases in NCAR CAM3 using nudging during the DYNAMO field campaign**, *Virtual workshop on Bias Corrections in Subseasonal to Interannual Predictions (Sept 2014)*
- **Subramanian, A. C.**, Guang Zhang 2013: **Diagnosing MJO forecast biases in the NCAR Community Atmosphere Model during the DYNAMO field campaign**, *AGU Annual Meeting, San Francisco, CA (December 2013)*
- **Subramanian, A. C.**, Ian Eisenman, Simona Bordoni 2013: **The influence of sea ice albedo on the global hydrological cycle**, *AGU Annual Meeting, San Francisco, CA (December 2013)*
- **Subramanian, A. C.**, I. Hoteit, B. D. Cornuelle, K. Armour 2013: **Quantifying uncertainty in Transient Climate Sensitivity subject to uncertainty in forcing and natural variability using a non-Gaussian filter**, *6th WMO Data assimilation symposium (October 2013)*
- **Subramanian, A. C.**, Guang Zhang 2013: **Modified convection scheme in CAM to improve MJO predictability**, *93rd American Meteorological Society Annual Meeting Austin, TX (January 2013)*
- **Subramanian, A. C.**, M. Jochum, A. J. Miller, R. Neale, H. Seo, D. Waliser, R. Murtugudde 2012: **The Madden-Julian Oscillation and Global Warming: A study in CCSM4**, *AGU Annual Meeting, San Francisco, CA (December 2012)*
- **Subramanian, A. C.**, Guang Zhang, Mitch Moncrieff, 2012: **A study of the sensitivity of the MJO initiation in CAM to moist processes and nonlinear momentum feedback**, *1st Pan-GASS Workshop, Boulder, CO (October 2012)*
- **Subramanian, A. C.** 2011: **The Madden-Julian Oscillation in CCSM4**, *Invited seminar at Jet Propulsion Laboratory, Pasadena, CA (Dec 1, 2011)*
- **Subramanian, A. C.**, M. Jochum, A. J. Miller, R. Murtugudde, R. Neale, D. Waliser, 2011: **The Madden-Julian Oscillation in CCSM4**, *WCRP OSC, Denver, CO (October 2011)*
- **Subramanian, A. C.**, A. J. Miller, B. D. Cornuelle 2011: **Understanding Ocean Processes during VOCALS- A data assimilation framework**, *VOCALS 3rd Annual Meeting, Miami, FL (March, 2011)*
- **Subramanian, A. C.** 2011: **The Madden-Julian Oscillation in a Low and High ENSO period**, *Invited seminar at CAOS, Indian Institute of Science, Bangalore, India (Jan 7, 2011)*

- **Subramanian, A. C.**, I. Hoteit, L. Neef and H. Song, 2010: **Implementation of the nonlinear filtering problem to study balance in dynamical scales**, *28th IUGG Conference on Mathematical Geophysics, Pisa, Italy (June, 2010)*
- **Subramanian, A. C.**, A. J. Miller, 2009: **Eddy Resolving Ocean model of VOCALS domain - A data assimilation framework**, *VOCALS 2nd Annual Meeting, Seattle, WA*
- **Subramanian, A. C.**, I. Hoteit, L. Neef and H. Song, 2009: **Implementation of the nonlinear filtering problem to study balance in dynamical scales**, *5th WMO Symposium on Data Assimilation, Melbourne, Australia (October, 2009)*
- **Subramanian, A. C.**, A. J. Miller, 2009: **Eddy Resolving Ocean model of VOCALS domain - A data assimilation framework**, *8^{9th} AMS Annual Meeting, Phoenix, AZ (Jan, 2009)*
- Putrasahan, D, **Subramanian, A. C.**, A. J. Miller, 2009: **Coastal Jets and Upwelling Events in the Humboldt Current System**, *2009 AGU Fall Meeting, San Francisco, CA (Dec, 2009)*
- A. J. Miller, **Subramanian, A. C.**, Putrasahan, D 2008: **Regional Coupled Modeling and Ocean data assimilation**, *VOCALS 1st Annual Meeting, Boulder, CO (Mar, 2008)*
- **Subramanian, A. C.**, A. J. Miller, B. D. Cornuelle 2008: **Regional Ocean Modeling of the South East Pacific - A data assimilation framework**, *55th Annual Eastern Pacific Ocean Conference, Fallen Leaf Lake, California (Sept., 2008)*

Workshops Attended

- **2016 Workshop on Subseasonal to Seasonal Extremes**
Conducted by Columbia University, New York.
- **2015 Workshop on Subseasonal to Seasonal predictability**
Conducted by ECMWF, Reading, UK.
- **2015 Workshop on Translating Process Understanding to Improve Climate Models**
Conducted by U. S. CLIVAR and GFDL.
- **2015 Workshop on Stochastic Parametrisation in Climate Models**
Conducted by ECMWF, Reading, UK.
- **2014 Workshop on Tropical Dynamics and the MJO**
Conducted by CMMAP, CSU, Fort Collins.
- **2013 MJO Field Data and Science Workshop**
Conducted by DYNAMO Project Office, NCAR EOL.
- **2012 IAMCS Workshop on Climate Science and Spatial Statistics**
Conducted by IAMCS, Texas A & M University, College Station, Texas.
- **2012 An Advanced Study Program Summer Colloquium on Weather-Climate Intersection**
Conducted by National Center for Atmospheric Research, Boulder, Colorado.
- **2012 Workshop on Physics of Climate Models**
Conducted by JPL and Keck Institute of Space Sciences, California Institute of Technology, Pasadena
- **2010 Workshop on Inverse Ocean Modeling in ROMS**
Conducted by Prof. Andrew Moore, University of California, Santa Cruz
- **2010 International Summer School for Observing, Assimilating and Forecasting the Ocean** *Conducted by Global Ocean Data Assimilation Experiment, Perth, Australia*

- **2009 JCSDA Summer Colloquium on Data Assimilation** *Conducted by* Joint Center for Satellite Data Assimilation, Stevenson, Washington.
- **2009 WGOMD Workshop on Ocean Mesoscale Eddies** *Conducted by* US CLIVAR, WCRP and UK Met Office, Exeter, UK
- **2008 An Advanced Study Program Summer Colloquium on Numerical Techniques for Global Atmospheric Models**
Conducted by National Center for Atmospheric Research, Boulder, Colorado.
- **2007 ROMS User Workshop**
Conducted by University of California, Los Angeles
- **2007 Workshop on Inverse Ocean Modeling in ROMS**
Conducted by Prof. Andrew Moore, University of California, Santa Cruz
- **2006 Workshop on Data Assimilation Techniques in Meteorology**
Organised by IISc(Indian Institute of Science) and ISRO(Indian Space Research Organisation)

Professional Experience

IISc : Research Assistant, Summer, 2003

SIO : 2 week cruise to measure Internal Tides in the Santa Cruz Basin.