

Aneesh C. Subramanian

Atmospheric and Oceanic Sciences
University of Colorado Boulder
Phone: +1 (858) 598-4719
aneeshcs@colorado.edu

Academics

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

Field of specialization Prediction and predictability from weather to climate timescales and improving understanding and representation of climate processes in weather and climate 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.

Professional Experience

2019 - present Asst. Professor, Atmospheric and Oceanic Sciences, University of Colorado Boulder

2019 - present Visiting Scientist, CW3E, Scripps Institution of Oceanography

2017 - present Visiting Scientist, Physics Department, Oxford University

2017 - 2018 Project Scientist, Climate Research Division, Scripps Institution of Oceanography

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

Mentoring experience

¹ Subramanian as primary advisor/mentor for student/postdoc/research assistant

² Subramanian as secondary advisor/mentor for student

³ Subramanian as member of Ph.D./Masters committee (not as primary/secondary advisor/mentor)

Postdocs : Dr. Ulla Heede¹ (2023-present, CU Boulder)
Dr. Devon Dunmire¹ (2022-present, CU Boulder)
Dr. Ho-Hsuan Wei¹ (2020-2022, CU Boulder)
Dr. Rui Sun¹ (2017-2019, SIO/UCSD)

Research scientist : Dave Reynolds¹ (2020-present, CU Boulder)

Grad. students at CUB : Danni Du¹ (ATOC Ph.D. candidate; 2019-present)
Tim Higgins¹ (ATOC Ph.D. candidate; 2020-present)
Lucas Howard¹ (ATOC Ph.D. ; 2021-present)
Ziqi Yin¹ (ATOC Ph.D.; 2021-present)
Mark Leonard² (ATOC M.Sc. received; 2022)
Alex Schein¹ (APPM Ph.D.; 2022-present)
Nidhin Harilal² (Comp. Sci. Ph.D.; 2022-present)

Grad. Committee Member :

Clairisse Reiher³ (Ph.D. candidate; 2023-present)
Brennan Dettmann³ (M.Sc. received; 2023)
Sam Mogen³ (Ph.D. candidate; 2022-present)
Erin Gunderian³ (Ph.D. candidate; 2022-present)
Becca Baiman³ (Ph.D. candidate; 2021-present)
Michelle Macleannan³ (Ph.D. candidate; 2021-present)
Matt Watwood³ (Ph.D. candidate; 2021-present)
Kang Yang³ (Ph.D. candidate; 2021-present)
Jason West³ (Ph.D. received; 2020)
Zofia Stanley³ (APPM Ph.D. received; 2021)

Grad. students at UCSD : Jonathan Eliashiv² (Ph.D.; 2014-2019)
Nathali Cordero-Quiros² (Ph.D.; 2015-2020)
Will Chapman² (Ph.D.; 2016-2021)

Grad. student at UMBC : Sahara Ali² (2022-present)

Grad. student at U. Minn. : Subhankar Ghosh² (2022-present)

Grad. student at U. Oxford : Mark Hortop¹ (M.Sc. (Phys). 2015-2016)

Undergraduate students : Zaria Cast¹ (Summer 2023; SOARS research mentor)
Brendan Myers¹ (Summer 2023; research mentor)
Emily Martinez¹ (Summer 2022; SOARS research mentor)
Jose Chapa¹ (Summer 2022; ATOC REU research mentor)
Muntaha Pasha¹ (Fall 2021; research mentor)
Frederico Diego¹ (Fall 2021; research mentor)
Alison Jarvis¹ (Fall 2020; research mentor)
Yingxuan Liu¹ (Summer 2018; UCSD Faculty Mentor Program)
Andrew Orkney² (Summer 2016; Univ. of Oxford)
Ben Huddart¹ (Summer 2015; Univ. of Oxford)

Teaching

at CU Boulder :

- [S2023] “ATOC 5060 - Atmosphere and Ocean Dynamics”
- [F2022] “ATOC 4870/5870 - Climate Modeling”
- [F2021] “ATOC 1050: Weather & the Atmosphere”
- [F2020] “ATOC 4500 - Climate Modeling Laboratory”
- [F2019] “ATOC 1050: Weather & the Atmosphere”
- [S2019] “ATOC 4500 - Climate Modeling”

Teaching and Mentoring Training

at CU Boulder

- [2020] Fellow of Early Career Geoscience Faculty Workshop
- [2020] ASSETT’s Strategic Course Design for Flexible Teaching Modes workshop
- [2019] Fellow of CU Boulder NSF-sponsored Active Learning Academy (ALA) and completed the ”Learning by Design” Program in Fall 2019.
- [2019] CU Boulder College of Arts and Sciences Faculty Development Program (2019-2020)
- [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.
- [2013] The College Classroom, a CIRTL certification course on evidence-based teaching practices that support student learning.
- [Winter (2008, 2009, 2011)] TA for an undergraduate class “Solid and Fluid Earth”

at Oxford Univ.

- [2016] Lecturer for Third year undergrad course on Physical Oceanography in the Michaelmas term.
- [2016] Evaluator of MPhys projects in the Department of Physics at the University of Oxford
- [2014, 2015] Tutor in the “Physics of the Atmosphere and Oceans” course for senior undergraduates and first year graduate students in Physics.

Academic Services

- 2019 - present Member of AR Recon Modeling and Data Assimilation Steering Committee
- 2021-2022 Member of the Priorities for Weather Research (PWR) US NOAA Task Team
- 2020-present Member of the CLIVAR Global Synthesis and Observations Panel (GSOP)
- 2020-present Member of the World Climate Research Programme’s Digital Earths Lighthouse Activity
- 2021-2022 **Co-Chair of Scientific Organizing Committee** for the NCAR ASP Summer Colloquium 2021 “Science of Subseasonal to Seasonal Predictions”
- 2021 **Co-Chair of Scientific Organizing Committee** for the US CLIVAR Workshop “Tropical Pacific Observing Needs to Advance Process Understanding and Representation in Models Workshop”
- 2015 **Chair of Scientific Organizing Committee** for the US CLIVAR Workshop “Translating Process Understanding to Improve Climate Models”
- 2015-present **Associate Editor**, Atmospheric Science Letters (Royal Meteorological Soc.)
- 2021-present **Associate Editor**, Predictions and Projections, Frontiers in Climate.
- 2017-2021 **Member and Co-Chair** of the US CLIVAR Phenomena, Observations and Synthesis (POS) Panel
- 2017 and 2021 Member of DOE Review Panel

- 2018 Member of NOAA proposal review panel
- 2021 Member of NASA proposal review panel
- 2019 - 2022 Member of the NOAA MAPP S2S Task Force
- 2016; 2017 **Session Chair** for the AGU Fall Meeting
- 2018; 2020; 2022; 2024 **Session Chair** for the Ocean Sciences Meeting
- 2014 Member of the CPT Review Committee of the US CLIVAR PSMI Panel
- 2013-2016 Member of the US CLIVAR Process Studies and Model Improvement (PSMI) Panel
- 2016 **Co-convener** of mini-symposium on “Quantifying and Accounting for Uncertainties in Large Scale Models” at the SIAM 2016 UQ Meeting, Lausanne, Switzerland.
- 2013 **Co-convener** of mini-symposium on “Uncertainty Quantification in Climate and Weather Models” at the SIAM 2013 Annual Meeting, San Diego.
- 2009,2010,2011 Member of SIO Computing committee
- 2007, 2011 Student member of SIO faculty search committee
- 2008 Member of National Ocean Science Bowl (San Diego Chapter) organizing team
 - **Reviewer** for Nature, Nature Communications, Nature Climate Change, Geophysical Research Letters, 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 proposals (3).

Academic Services at CU Boulder

- 2022 Chair of faculty hiring search committee
- 2021 Member of faculty hiring search committee
- 2019-2024 **ATOC Department Representative** for the NSF PRIMERS CUB: NSF-funded project to enhance and reform STEM Education
- 2019-present **Committee membership in ATOC** Admissions committee, Technology committee, JEDI committee, Space committee
- 2020 **Faculty Reviewer** for CU Boulder Undergraduate Research Opportunities Program.

Academic Honours

- CU RIO Faculty Fellow 2023
- Fellow at the Kavli Institute for Theoretical Physics (KITP) program on “Machine Learning and the Physics of Climate”. 2021
- 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

Total awarded: \$20,157,832 (at CU Boulder: \$ 5,168,369)

Recommeneded for funding: \$ 895,524 (at CU Boulder: \$625,524)

- with funds at CU Boulder :
15. **co-PI for DOE grant; PI: Prof. Han at CUB** - Sea Level Extremes Along the U.S. East Coast in E3SM: Simulations of the Recent Past and Projections of the Near Future. (2023 - 2027) [**\$ 895,524 with \$ 625,524 at CU Boulder**]
 14. **PI for NOAA grant; co-PI: Prof. Karnauskas at CUB** - (funded under NOAA-OAR-CPO-2022-2006799: CVP) Optimizing coupled boundary layer process studies in the tropical Pacific using high-resolution models and in situ observations. (2022 - 2025) [**\$ 889,908 with \$ 540,262 at CU Boulder**]
 13. **PI for ONR grant** - High resolution coupled modeling and data assimilation for improved understanding of transition layer processes in the Arabian Sea Warm Pool. (2022 - 2027) [**\$ 837,454 with \$ 567,454 at CU Boulder**]
 12. **co-PI and CU PI for NSF grant; PI: Dr. Johnson at UW/APL** - Collaborative Research: Coupled Ocean Mixed Layer Processes Driving Sea Surface Temperature. (2022 - 2025) [**\$ 356,233 with \$ 37,264 at CU Boulder**]
 11. **co-PI and CU PI for NSF grant; PI: Dr. Janeja at UMBC** - HDR Institute: HARP- Harnessing Data and Model Revolution in the Polar Regions. (2022 - 2027) [**\$ 13,700,002 with \$ 994,684 at CU Boulder**]
 10. **co-PI and CU PI for KAUST grant; PI: Prof. Hoteit at KAUST** - Arabian Peninsula's land-based and marine heatwaves: variability, drivers, trends, and predictability up to sub-seasonal scales. (2022-2025) [**\$ 1,000,000 with \$307,588 at CU Boulder**]
 9. **PI for NASA grant; co-I: Prof. Han at CUB** - An improved understanding of the role of the ocean surface salinity and salinity stratification in modulating tropical atmospheric intraseasonal oscillations. (2022-2026) [**\$ 786,397 with \$ 471,927 at CU Boulder**]
 8. **co-PI and CU PI for NOAA grant; PI: Prof. Heimbach at UT Austin** - Collaborative Research: Uncertainty Quantification, data quality, and observing network design in an ocean state of the Tropical Pacific. (2021-2024) [**\$ 445,322 with \$ 127,004 at CU Boulder**]
 7. **co-PI and CU PI for NSF grant; PI: Dr. Eddebbar at SIO/UCSD** - Collaborative Research: Mesoscale Drivers of Oxygen in the Tropical Pacific. (2020-2023) [**\$ 679,707 with \$ 54,656 at CU Boulder**]
 6. **co-PI and CU PI for US Army Core of Engineers grant; PI: Dr. Ralph at SIO/UCSD** - Water Operations Technical Support: Research to Investigate Atmospheric Rivers (AR) and the Feasibility of Developing and Using AR Forecast Capabilities to Inform Reservoir Operations within the USACE. (2019-2024) [**\$ 482,736 at CU Boulder**]

5. **co-PI and CU PI for USBR grant; PI: Dr. Gershunov at SIO/UCSD** - Seasonal to Sub-seasonal (S2S) predictability of Heat Waves over the Western US: Impacts on Snowpack. (2019-2021) [**\$ 41,417 at CU Boulder**]
4. **co-PI and CU PI for California DWR grant; PI: Dr. Ralph at SIO/UCSD** - Atmospheric Rivers Program Phase 2. (2019-2021) [**\$ 164,967 at CU Boulder**]
3. **PI for NOAA grant; co-PI: Dr. Karnauskas at CUB** - Improved Understanding of air-sea interaction processes and biases in the Tropical Western Pacific using observation sensitivity experiments and global forecast models. (2018-2020) [**\$ 567,285 with \$ 439,975 at CU Boulder**]
2. **co-PI for NOAA grant; PI: Dr. Miller at SIO/UCSD** - Understanding and Quantifying the Predictability of Marine Ecosystem Drivers in the California Current System. (2017-2021) [**\$ 50,886 at CU Boulder**]
1. **co-PI and CU PI for ONR grant; PI: Dr. Miller at SIO/UCSD** - Prediction of Monsoon Intra-Seasonal Oscillations using high-resolution coupled modeling and data-assimilation. (2017-2023) [**\$ 262,025 at CU Boulder**]

- Prior to CU Boulder :**
4. **co-PI for KAUST grant** - Virtual Red Sea Initiative (2017-2019).
 3. **PI for NOAA grant** - A Nudging and Ensemble Forecasting Approach to Identify and Correct Tropical Pacific Bias-Producing Processes in CESM (2014-2018).
 2. **co-PI for NSF grant** - EASM-3: Collaborative Research: Quantifying Predictability Limits, Uncertainties, Mechanisms, and Regional Impacts of Pacific Decadal Climate Variability. (2014-2018).
 1. **co-I for NASA grant** - Assessing the Impact of Diurnal Wind Variability (2014-2018).

Publications

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

¹ Subramanian as primary advisor/mentor for student/post-doc

² Subramanian as secondary advisor/mentor for student

In review

- **Higgins, T. B.¹, A. C. Subramanian**, W. E. Chapman, D. Lavers, and A. C. Winters (2024) : Subseasonal Potential Predictability of Horizontal Water Vapor Transport and Precipitation Extremes in the North Pacific. *Weather and Forecasting*, sub judice.
- Eddebbar, Y., D. Whitt, A. Verdy, M. Mazloff, **A. C. Subramanian** and M. Long (2024): Eddy-Mediated Mixing of Oxygen in the Equatorial Pacific, *JGR-Oceans*, sub judice.
- **Du, D.¹, A. C. Subramanian**, W. Han, U. Ninad and J. Runge (2024) : Causal Analysis Discovers an Enhanced Impact of Tropical Western Pacific on Indian Summer Monsoon Subseasonal Anomalies, *GRL*, sub judice.
- Ali S., O. Faruque, Y. Huang, Md. Osman Gani, **A. C. Subramanian**, N-J Schlegel, J. Wang (2024): Quantifying Causes of Arctic Amplification via Deep Learning based Time-series Causal Inference, *ICMLA*.
- Cannon, F.; Weihs, R.; Steinhoff, D.; Papadopoulos, C.; Kawzenuk, B.; Mulrooney, P.; Zheng, M.; Yao, P.; Cobb, A.; Wilson, A.; Martin, A.; **Reynolds, D.**; **Aneesh Subramanian**; Monache, L. D.; Ralph, F. M. (2024): Precipitation Forecast Skill and Uncertainty Over California Watersheds in a High-Resolution Ensemble, *Mon. Wea. Rev.*, sub judice.

Published since CU Boulder

61. Li, L., Cannon, F., Mazloff, M. R., **Subramanian, A. C.**, Wilson, A. M., and Ralph, F. M. (2024): Impact of atmospheric rivers on Arctic sea ice variations, *The Cryosphere*, 18, 121–137, <https://doi.org/10.5194/tc-18-121-2024>, 2024.

60. **Howard, L.¹, A. C. Subramanian**, I. Hoteit (2024): A Machine Learning Augmented Data Assimilation Method for High-Resolution Observations. *Journal of Advances in Modeling Earth Systems*, 16(1), p.e2023MS003774.
59. **Du, D.¹, Subramanian, A.C.**, Han, W., Chapman, W.E., Weiss, J.B. and Bradley, E., (2023): Increase in MJO predictability under global warming. *Nature Climate Change*, 14, 68–74 (2024). <https://doi.org/10.1038/s41558-023-01885-0>
58. Guirguis, K., A. Gershunov, B. Hatchett, M. DeFlorio, **A. C. Subramanian**, R. Clemesha, L. D. Monache, F. M. Ralph (2023): Subseasonal prediction of impactful California weather in a hybrid dynamical-statistical framework, *Geophysical Research Letters*, 50(23), p.e2023GL105360.
57. Shulgina, T., A. Gershunov, B. Hatchett, K. Guirguis, **A. C. Subramanian**, S. A. Margulis, Y. Fang, D. R. Cayan, D. W. Pierce, M. Dettinger, M. L. Anderson, F. M. Ralph (2023): Observed and projected changes in snowline and snow accumulation in California Sierra Nevada and Cascade Ranges, *Climate Dynamics*, 61, 4809–4824 (2023). <https://doi.org/10.1007/s00382-023-06776-w>.
56. **H-H. Wei¹, Subramanian, A. C.**, K. B. Karnauskas, **D. Du¹**, C. A. DeMott, M. R. Mazloff, M. A. Balmaseda, F. Vitart, and B. Sarojini (2023): Tropical Pacific subseasonal forecast: the role of mean state biases, model errors, and ocean data assimilation. *QJRMS*, sub judice.
55. Sun, R., Cobb, A., Bôas, A. B. V., Langodan, S., **Subramanian, A. C.**, Mazloff, M. R., Cornuelle, B. D., Miller, A. J., Pathak, R. and Hoteit, I. (2023): Waves in SKRIPS: WaveWatch III coupling implementation and a case study of cyclone Mekunu, GMD, <https://doi.org/10.5194/egusphere-2022-1298>
54. Verdy, A., Mazloff, M., Cornuelle, B. D., **Subramanian, A. C.** (2023): Balancing volume, temperature, and salinity budgets in the tropical Pacific Ocean state estimate, *JGR Oceans*, <https://doi.org/10.1029/2022JC019576>.
53. Zhang, Z., DeFlorio, M. J., Monache, L. D., **Subramanian, A. C.**, Ralph, F. M., Waliser, D. E., Zheng, M., Guan, B., Goodman, A., Molod, A. M., Vitart, F., Kumar, A., Lin, H. (2023): Multi-Model Subseasonal Prediction Skill Assessment of Water Vapor Transport Associated with Atmospheric Rivers over the Western U.S., *JGR-Atmospheres*, In press. <http://doi.org/10.1029/2022JD037608>
52. **Higgins, T.¹, Subramanian, A. C.**, Graubner, A., Kapp-Schwoerer, L., Watson, P., Sparrow, S., Kashinath, K., Kim, S., Monache, L. D., Chapman, W. (2023): Using Deep Learning for an Analysis of Atmospheric Rivers in a High-Resolution Large Ensemble Climate Dataset, *JAMES*, 15(4), p.e2022MS003495.
51. Ghosh, S., Miller, A. J., **Subramanian, A. C.**, Bhatla, R., Das, S. (2023): Signals of northward propagating Monsoon Intraseasonal Oscillations (MISO) in the RegCM4.7 CORDEX-CORE simulation over South Asia domain, *Climate Dynamics*, <https://doi.org/10.1007/s00382-023-06729-3>.
50. B. Ait-El-Fquih, **A. C. Subramanian**, I. Hoteit (2023): A variational Bayesian approach for ensemble filtering of stochastically parametrized systems, *QJRMS*, 149(754), pp.1769-1788.
49. **Du, D.¹, A. C. Subramanian**, W. Han, **H-H Wei**, B. B. Sarojini, M. Balmaseda, F. Vitart (2023): Assessing the impact of ocean in situ observations on MJO propagation across the Maritime Continent in ECMWF subseasonal forecasts. *Journal of Advances in Modeling Earth Systems*, 15, e2022MS003044. <https://doi.org/10.1029/2022MS003044>.
48. Reynolds, C. A., Stone, R. E., Doyle, J. D., Baker, N. L., Wilson, A. M., Ralph, F. M., Lavers, D. A., **Subramanian, A. C.**, Centurioni, L. (2023). Impacts of Northeastern Pacific Buoy Surface Pressure Observations, *Monthly Weather Review*, 151(1), 211-226
47. Cronin, M. F., S. Swart, et al., **A. C. Subramanian** (2022): Developing an Observing Air-Sea Interactions Strategy (OASIS) for the global ocean. *ICES Journal of Marine Science*, 10.1093/icesjms/fsac149.
46. DeMott, C. A., **A. C. Subramanian**, Chen, S., Drushka, K., Fujii, Y., Sutton, A., Sprintall, J., Zhang, D. (2022). Focused Observations for Expanded Comprehension:

45. Guirguis, K., A. Gershunov, B. Hatchett, T. Shulgina; M. J. DeFlorio, **A. C. Subramanian**, J. Guzman-Morales, R. Aguilera, R. Clemesha, T. W. Corringham, L. Delle Monache, D. Reynolds, A. Tardy, I. Small, F. M. Ralph (2022): Winter wet–dry weather patterns driving atmospheric rivers and Santa Ana winds provide evidence for increasing wildfire hazard in California. *Climate Dynamics*, In press, <https://doi.org/10.1007/s00382-022-06361-7>.
44. Cobb, A.; F. M. Ralph; V. Tallapragada; A. M. Wilson; C. A. Davis; L. Delle Monache; J. D. Doyle; F. Pappenberger; C. A. Reynolds; **A. C. Subramanian**; Peter G. Black; Forest Cannon; Chris Castellano; Jason M. Cordeira; Jennifer S. Haase; Chad Hecht; Brian Kawzenuk; David A. Lavers; Michael Murphy; Jack Parrish; Ryan Rickert; Jonathan J. Rutz; Ryan Torn; Xingren Wu; Minghua Zheng (2022): Atmospheric River Reconnaissance 2021: A Review, *Weather and Forecasting*, In Press, <https://doi.org/10.1175/WAF-D-21-0164.1>.
43. Simmonds EG, Adjei KP, Andersen CW, Hetle Aspheim JC, Battistin C, Bulso N, Christensen HM, Cretois B, Cubero R, Davidovich IA, **A. C. Subramanian** et. al. (2022): Insights into the quantification and reporting of model-related uncertainty across different disciplines. *iScience*. 25 (12): 105512.
42. Chandra, V., S. Sandeep, E. Suhas, **A C Subramanian** (2022): Weakening of Indian summer monsoon synoptic activity in response to polar sea ice melt induced by albedo reduction in a climate model. *Earth and Space Science*, 9, e2021EA002185. <https://doi.org/10.1029/2021EA002185>
41. Wilson, A. M.; A. Cobb; F. M. Ralph; V. Tallapragada; C. Davis; J. Doyle; L. Delle Monache; F. Pappenberger; C. Reynolds; **A. C. Subramanian**; F. Cannon; J. Cordeira; J. Haase; C. Hecht; D. Lavers; J. J. Rutz; M. Zheng (2022): Atmospheric River Reconnaissance Workshop Promotes Research and Operations Partnership. *BAMS*, <https://doi.org/10.1175/BAMS-D-21-0259.1>.
40. Giglio, D., S. T. Gille, B. Cornuelle, **A C Subramanian**, J. F. Turk, S. Hristova-Velva, D. Northcott (2022): Annual modulation of diurnal winds in the tropical oceans. *Ocean Remote Sensing*, 14(3), p.459.
39. Sun, R., A. B. Villas Boas, **A. C. Subramanian**, M. R. Mazloff, A. J. Miller, S. Langodan, I. Hoteit (2022) : Focusing and defocusing of tropical cyclone generated waves by ocean current refraction. *Journal of Geophysical Research: Oceans*, 127, e2021JC018112. <https://doi.org/10.1029/2021JC018112>.
38. **Chapman, W. E.**², L. Delle Monache, S. Alessandrini, **A. C. Subramanian**, F. M. Ralph, S-P Xie, S. Lerch, N. Hayatbini (2022) : Probabilistic Predictions from Deterministic Atmospheric River Forecasts with Deep Learning, *Monthly Weather Review*, 150(1), 215-234.
37. Eddebbar, Y. E., **A. C. Subramanian**, D. Whitt, M. C. Long, A. Verdy, M. Mazloff, and M. Merrifield (2021) : Seasonal Modulation of Dissolved Oxygen in the Equatorial Pacific by Tropical Instability Vortices. *JGR-Oceans*, 126(11), p.e2021JC017567.
36. Zheng, M., L. Delle Monache, B. D. Cornuelle, F. M. Ralph, V. S. Tallapragada, **A. C. Subramanian**, J. S. Haase, Z. Zhang, X. Wu, M. J. Murphy, T. B. Higgins, L. DeHaan (2021) : Improved Forecast Skill through the Assimilation of Dropsonde Observations from the Atmospheric River Reconnaissance Program. *JGR-Atmosphere*, 126(21), p.e2021JD034967.
35. **Chapman, W.**², **A. C. Subramanian**, S-P Xie, F. M. Ralph, M. D. Sierks, Y. Kamae (2021): Monthly Modulations of ENSO Teleconnections: Implications for Potential Predictability in North America, *Journal of Climate*, 34(14), 5899-5921.
34. Pathak, R., H. P. Dasari, S. El Mohtar, **A. C. Subramanian**, S. Sahany, S. K. Mishra, O. Knio and I. Hoteit (2021) : Uncertainty Quantification and Bayesian Inference of Cloud Parameterization in the NCAR Single Column Community Atmosphere Model (SCAM6). *Frontiers in Climate Predictions and Projections*, In Press.

33. **Wei, H-H.**¹, **A. C. Subramanian**, K. Karnauskas, C. A. DeMott; M. R. Mazloff; M. A. Balmaseda, (2021): Tropical Pacific Air-sea Interaction Processes and Biases in CESM2 and their Relation to El Nino Development. *JGR-Oceans.*, 126, e2020JC016967. <https://doi.org/10.1029/2020JC016967>.
32. Sun, R., **A. C. Subramanian**, B. D. Cornuelle, M. Mazloff, A. J. Miller, H. Seo and I. Hoteit (2020): The role of air-sea interactions in atmospheric river events: Case studies using the SKRIPS regional coupled model. *JGR-Atmospheres*, 126, e2020JD032885. <https://doi.org/10.1029/2020JD032885>.
31. Meehl, G, J Richter, H Teng, A Capotondi, K Cobb, F Doblas-Reyes, M Donat, et al., **A. C. Subramanian** (2020): Initialized Earth system prediction from subseasonal to decadal timescales, *Nature Reviews Earth & Environment* 2(5): 340-357.
30. Shroyer, E., **A. C. Subramanian**, et al., (2020): Bay of Bengal Intraseasonal Oscillations and the 2018 Monsoon Onset. *BAMS*, doi:10.1175/BAMS-D-20-0113.1.
29. Haupt, S. E., W. Chapman, S. V. Adams, C. Kirkwood, J. S. Hosking, N. H. Robinson, S. Lerch, **A. C. Subramanian**, (2020): Towards Implementing AI Post-processing in Weather and Climate: Proposed Actions from the Oxford 2019 Workshop. *Phil. Trans. of the RMS A*, In Press.
28. Zheng, M., L. D. Monache, X. Wu, F. M. Ralph, B. D. Cornuelle, V. Tallapragada, J. S. Haase, A. M. Wilson, M. Mazloff, **A. C. Subramanian**, F. Cannon (2020): Data Gaps within Atmospheric Rivers over the Northeastern Pacific, *BAMS*, In Press.
27. Guirguis, K., A. Gershunov, M. DeFlorio, T. Shulgina, L. D. Monache, **A. C. Subramanian**, T. Corringham, M. Ralph (2020): Four North Pacific circulation regimes and their relationship to California precipitation on daily to seasonal timescales, *GRL*, In Press.
26. Fredriksen, H-B., J. Berner, **A. C. Subramanian**, A. Capotondi (2020): How Does El Nino Southern Oscillation Change Under Global Warming - A First Look at CMIP6, *GRL*, In Press.
25. Beal, L., et al., **A. C. Subramanian** (2020): A roadmap to IndOOS-2: Better observations of the rapidly-warming Indian Ocean, *BAMS*, 101(11), pp.E1891-E1913.
24. Hoteit, I., et al., **A. C. Subramanian** (2020): Towards an End-to-End Analysis and Prediction System for Weather, Climate, and Marine Applications in the Red Sea, *BAMS*, 102(1), pp.E99-E122.
23. 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, (2020): Forecast Errors and Uncertainties in Atmospheric Rivers, *Weather and Forecasting*, 35(4), pp.1447-1458.
22. Raboudi, N. F., B. Ait-El-Fquih, **A. C. Subramanian**, and I. Hoteit (2020): Enhancing Ensemble Data Assimilation into One-Way-Coupled Models with One-Step-Ahead-Smoothing, *QJRMS*, 147(734), pp.249-272.
21. 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, (2020): Seasonal-to-interannual prediction of U.S. coastal marine ecosystems: Forecast methods, mechanisms of predictability, and priority developments. *Progress in Oceanography*, 183, p.102307.
20. Gagne, D. J., H. Christensen, **A. C. Subramanian**, A. Monahan (2020): Machine Learning for Stochastic Parameterization: Generative Adversarial Networks in the Lorenz '96 Model, *JAMES*, 12(3), p.e2019MS001896.
19. 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., (2020): West Coast Forecast Challenges and Development of Atmospheric River Reconnaissance, *BAMS*, 101(8), pp.E1357-E1377.

18. Gopal, G., **A. C. Subramanian**, A. J. Miller, H. Seo, D. Sengupta, (2020): Estimation and Prediction of the Upper Ocean Circulation in the Bay of Bengal, *Deep Sea Research Part II: Topical Studies in Oceanography*, 172, p.104721.
17. **Eliashiv, J.², A. C. Subramanian**, A. J. Miller, (2020): A Reliability Budget analysis of CESM-DART, *JAMES*, 12(2), p.e2019MS001678.
16. **Eliashiv, J.², A. C. Subramanian**, A. J. Miller, (2020): Tropical climate variability in Community Earth System Model and the Data Assimilation Research Testbed, *Clim. Dyn.*, 54(1-2), pp.793-806.
15. 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*, 124(21), pp.11242-11265..
14. **Chapman, W.², A. C. Subramanian**, Monache, L.D., and M. Ralph, (2019): Improving atmospheric river forecasts with machine learning. *Geophys. Res. Lett.*, 46(17-18), pp.10627-10635.
13. Villas Boas, A. B., Arduin, F., et al., **A. C. Subramanian**, (2019): Integrated observations of global surface winds, currents, and waves: requirements and challenges for the next decade. *Frontiers in Marine Science*, 6, p.425.
12. Hermes, J. C., Vialard, J., et al., **A. C. Subramanian**, (2019): Sustained Indian Ocean Observing System. *Frontiers in Marine Science*, In Press.
11. Capotondi, A., et al., **A. C. Subramanian**, (2019): Observational Needs: Marine Ecosystem Modeling and Forecast. *Frontiers in Marine Science*, In Press.
10. 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, (2019): A limited role for unforced internal variability in twentieth-century warming. *Journal of Climate*, 32(16), pp.4893-4917.
9. **Subramanian, A. C.¹**, et al., (2019): Ocean observations to improve our understanding, modeling and forecasting of subseasonal-to-seasonal variability. *Frontiers in Marine Science*, 6, p.391.
8. Penny, S. G., et al., **A. C. Subramanian**, (2019): Observational Needs for improving Ocean and Coupled Reanalysis, S2S Prediction, and Decadal Prediction. *Frontiers in Marine Science*, In Press.
7. **Sun, R.¹, A. C. Subramanian**, A. J. Miller, M. Mazloff, I. Hoteit, and B. D. Cornuelle (2019): A regional coupled ocean-atmosphere modeling framework (MITgcm-WRF) using ESMF/NUOPC: description and preliminary results for the Red Sea. *Geosci. Model Dev.*, 12, 4221–4244, <https://doi.org/10.5194/gmd-12-4221-2019>.
6. **Cordero-Quiros, N.²**, A. J. Miller, **A. C. Subramanian**, J. Y. Luo, (2019): A composite physical-biological ENSO in the California Current System, *Ocean Modelling*, 142, p.101439.
5. 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 Part II: Topical Studies in Oceanography*, 168, p.104617.
4. 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.*, 9(1), p.10993.
3. **Subramanian, A. C.**, S. Juricke, P. Dueben, T. N. Palmer, (2019): A Stochastic Representation of Sub-Grid Uncertainty for Dynamical Core Development. *BAMS*, 100(6), pp.1091-1101.
2. Rodrigues, R., **A. C. Subramanian**, L. Zanna, (2019): Decadal ENSO bimodality and extremes, *Geo. Res. Lett.*, 46(9), pp.4883-4893.
1. Eddebbar, Y., K. Rodgers, M. Long, **A. C. Subramanian**, S-P. Xie, and R. Keeling, (2019): El Nino-like Physical and Biogeochemical Ocean Response to Tropical Eruptions, *J. Clim.*, 32(9), pp.2627-2649.

31. **Zhan P.**², G. Gopalakrishnan, **A. C. Subramanian**, D. Guo, I. Hoteit, (2018): Sensitivity studies of the Red Sea eddies using adjoint method. *JGR Oceans*, 123 (11), 8329-8345.
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.*, 45(22), pp.12-576.
29. **Leung, K.**², **A. C. Subramanian**, S. S. P. Shen, (2018): Statistical Characteristics of the Long-term High-Resolution Data of Darwin Precipitable Water Vapor. *Advances in Data Science and Adaptive Analysis*, 10(04), p.1850010.
28. Shields, C, et al., **A. C. Subramanian**, (2018): Atmospheric River Tracking Method Intercomparison Project (ARTMIP): Project Goals and Experimental Design. *Geo. Mod. Dev.*, 11(6), pp.2455-2474.
27. **Dias, D. F.**², **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.*, 52, pp.3183-3201.
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. Counillon, C. Draper, S. Frolov, Y. Fujii, A. Karspeck, A. Kumar, P. Laloyaux, J-F. Mahfouf, M. Martin, M. Pena, 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. *WWRP*, No. GSFC-E-DAA-TN43810.
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. Ummerhofer, 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. 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.
17. 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, 566-584, doi:10.1002/2016MS000862.
16. **Subramanian, A. C.**, A Giannini, M Holland, S Legg, A Mahadevan, J Teixeira and C Ummerhofer, 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.¹, 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.², 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.², 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. *Advances in Data Science and Adaptive Analysis*, 8(02), p.1650006.
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.², 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 (2013): 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.
- Elipot, S., K. Drushka, A. Subramanian, and M. Patterson (2022), Overcoming the challenges of ocean data uncertainty, *Eos*, 103, <https://doi.org/10.1029/2022EO220021>. Published on 12 January 2022.

Conferences & Talks

Invited Talks

- Subramanian, A. C. 2023: **Panel presentation on challenges in modeling and forecasting earth's climate** , *2023 NSF Climate, Sustainability and Quantum Computing Workshop*
- Subramanian, A. C. 2023: **Exploring the impact of ocean data assimilation for improving Tropical Pacific forecasts using the ECMWF and NASA DA systems**, *NASA GMAO Seminar Series Spring 2023*)
- Subramanian, A. C. 2022: **Exploring the impact of ocean data assimilation for improving Tropical Pacific forecasts**, *NOAA CVP Seminar Series Fall 2022*)
- Subramanian, A. C. 2022: **Ocean coupling and climate data assimilation for improving Digital Earth simulations** , *WCRP Digital Earths Ultra High Resolution simulations workshop (Oct 2022)*
- Subramanian, A. C. 2022: **Exploring the impact of ocean coupling and data assimilation for improving weather to climate forecasts** , *Geophysical Fluids Laboratory, IIT Madras, Chennai, India (Aug 2022)*
- Subramanian, A. C. 2021: **Exploring physical and Machine Learning approaches for stochastic modeling and ensemble prediction of weather and climate**, *Kavli Institute for Theoretical Physics Conference on Machine Learning for Climate (November 2021)*
- Subramanian, A. C. 2021: **Data assimilation and prediction over the Indian Ocean region**, *Workshop on Geophysical Flows Lab (Sept 2021)*
- Subramanian, A. C. 2021: **Physical theories and stochastic modeling for monsoon prediction**, *Workshop on Prediction and Variability of Air-Sea Interactions: the South Asian Monsoon (August 2021)*
- Subramanian, A. C. 2021: **Ocean data assimilation and machine learning for improving subseasonal predictions**, *NOAA Physical Sciences Laboratory (August 2021)*
- Subramanian, A. C. 2020: **Thoughts on exciting directions to explore towards improving prediction skill of precipitation**, *NOAA-DOE Precipitation Prediction Challenge Workshop, US, (November 2020)*
- Subramanian, A. C. 2020: **Indian Ocean observations for improved process understanding and S2S forecasts**, *Session: V13H2S4, VAIBHAV Summit, India, (October 2020)*
- Subramanian, A. C. 2020: **Modeling and Data Assimilation panel discussion**, *Session: V13H2S8, VAIBHAV Summit, India, (October 2020)*
- Subramanian, A. C. 2020: **Exploring physical and machine learning methods for stochastic modeling and ensemble prediction of weather and climate**, *US CLIVAR Data Science Working Group Webinar Series, (October 2020)*
- Subramanian, A. C. 2020: **Representing uncertainty in models and observations for Earth System Predictability**, *ESIP (Oct 2020)*
- 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. 2022: **Exploring the impact of ocean coupling and data assimilation for improving monsoon intraseasonal forecasts**, *Ocean Sciences Meeting, virtual (Feb 2022)*
- Subramanian, A. C. 2021: **Impact of ocean observation systems on ocean analyses and subseasonal forecasts**, *WCRP DA Symposium (Sept. 2021)*
- Subramanian, A. C. 2020: **Impact of ocean observation systems on ocean analyses and subseasonal forecasts in the Indo-Pacific region**, *American Geophysical Union Annual Fall Meeting, Virtual Conference (Dec. 2020)*
- Subramanian, A. C. 2020: **The Impact of Additional Surface Pressure Observations over the Northeast Pacific Ocean on the Data Assimilated Analysis and Forecast of Atmospheric Rivers During Feb – Apr 2019**, *International Atmospheric River Conference, Virtual Conference (May 2020)*
- Subramanian, A. C. 2019: **Impact of ocean observation systems on ocean analyses and subseasonal forecasts**, *Workshop on Atmospheric Convection and Air-Sea Interactions over the Tropical Oceans, Boulder, CO (May. 2019)*
- 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**, *89th 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

- **2023 Workshop on Mesoscale and Frontal-Scale Air-Sea Interactions Workshop**
Conducted by US CLIVAR, Boulder, CO.
- **2022 Workshop on Future US Earth System Reanalysis**
Conducted by US CLIVAR, Boulder, CO.
- **2021 Workshop on Machine Learning for Climate**
Conducted by KITP, UCSB, Santa Barbara.
- **2021 Workshop on Science of Subseasonal to Seasonal Predictions**
Conducted by NCAR, Boulder.
- **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)