Kathleen (Kathy) Verzone Pegion

George Mason University, Dept of Atmospheric, Oceanic and Earth Sciences
4400 University Drive, MS6C5, Fairfax, VA 22030
Phone:703-993-5727, Email: kpegion@gmu.edu
http://mason.gmu.edu/~kpegion

EMPLOYMENT

Assistant Professor **Aug 2014-Present**
Department of Atmospheric Oceanic and Earth Sciences & Center for Ocean-Land-Atmosphere Studies, George Mason University, Fairfax, VA

Visiting Scientist **May 2016- Aug 2016**
National Center for Atmospheric Research, Boulder, CO

Research Scientist I/II **Feb 2009 – Mar 2015**
CIRES/University of Colorado & NOAA/ESRL/PSD, Boulder, CO

Research Scientist **May 2007-Jan 2009**
Center for Ocean-Land-Atmosphere Studies, Calverton, MD

Graduate Research Assistant **Dec 2002–May 2007**
Climate Dynamics Department, George Mason University, Fairfax, VA

Meteorologist **Feb 2001 – Dec 2002**
NOAA/NWS/Meteorological Development Laboratory, Silver Spring, MD

Scientific Programmer/Analyst **Aug 1999 – Feb 2001**
General Sciences Corporation-Science Applications International Corporation in support of the NASA Seasonal to Interannual Prediction Project, Goddard Space Flight Center, Greenbelt, MD

Graduate Research Assistant **Aug 1998–Aug 1999**
Center for Ocean-Atmosphere Prediction Studies, Florida State University, Tallahassee, FL

Undergraduate Research Assistant **Aug 1996 –Aug 1998**
Center for Ocean Atmosphere Prediction Studies, Florida State University, Tallahassee, FL

EDUCATION

Ph.D. Climate Dynamics, George Mason University, Fairfax, VA (2007)
M.S. Meteorology, Florida State University, Tallahassee, FL (1999)
B.S. Meteorology, Florida State University, Tallahassee, FL (1998)
B.S. Computer Science, Florida State University, Tallahassee, FL (1998)

PUBLICATIONS (* postdoc; + student)

In preparation

Elders, A.$^{+}$ and **K. Pegion**, 2016: Diagnosing Sea Ice from the North American Multi Model

Ensemble and Implications on Mid-latitude Winter Climate, to be submitted to Climate Dynamics NMME Special Issue

Pegion, K. and **T. Cicerone**[+], 2016: Evaluating predictability using the NMME, to be submitted to Climate Dynamics NMME Special Issue

Selman, C*. and **K. Pegion**, 2016: On the interannual and decadally varying components of ENSO precursors.

Submitted, in Revision, or in Press

Pegion, K. and **C. Selman***, 2016: Patterns of Climate Extremes: Trends and Mechanisms, Extratropical Precursors of the El Niño Southern Oscillation. S. –Y. Wang, R. Gillies, J. --H. Yoon, and C. Funk, Eds., AGU/Wiley-Blackwell, *in press*.

Tommassi, D., C. Stock, **K. Pegion**, G. Vecchi, R. Methot, M. Alexander, D. Checkley, 2016: The importance of predictive knowledge in setting dynamic harvest guidelines: a Pacific sardine example, *submitted to Ecological Applications*

White, C. J. and Coauthors, 2015: Applications of subseasonal-to-seasonal (S2S) predictions, *submitted to Bull. Amer Met. Soc.*

Published (peer-reviewed)

DelSole, T., C. Monteleoni, S. McQuade, M. K. Tippett, **K. Pegion**, and J. Shukla, 2015: Tracking Seasonal Prediction Models, Proceedings of the Fifth International Workshop on Climate Informatics: CI 2015. J. G. Dy, J. Emile-Geay, V. Lakshmanan, Y. Liu (Eds.) September 2015. ISBN: 978-0-9973548-0-5.

Stock, C. A., **K. Pegion**, G. A. Vecchi, M. A. Alexander, D. Tommasi, N. A. Bond, P. S. Fratantoni, R.G. Gudgel, T. Kristiansen, T. D. O'Brien, Y. Xue, X. Yang, 2015: Seasonal sea surface temperature anomaly prediction for coastal ecosystems, Progress in Oceanography, 137, Part A, 219-236. doi:10.1016/j.pocean.2015.06.007.

Kirtman, B. P and Coauthors, 2014: The North American Multi-Model Ensemble (NMME): Phase-1 Seasonal to Interannual Prediction, Phase-2 Toward Developing Intra-Seasonal Prediction, *Bull. Amer. Met. Soc.*,95, 585-601.

Pegion, K. and M. Alexander, 2013: The Seasonal Footprinting Mechanism in CFSv2: Simulation and Impact on ENSO Prediction, *Climate Dynamics*, 41, 1671-1683.

Pegion, K., and A. Kumar, 2013: Does an ENSO-Conditional Skill Mask Improve Seasonal Predictions?, *Mon. Wea. Rev.*, **141**, 4515–4533.doi: 10.1175/MWR-D-12-00317.1.

Pegion, K. and P. Sardeshmukh, 2011: Prospects for Improving Subseasonal Predictions, *Mon. Wea. Rev.,* 139, 3648-3666.

Shin, S., P. D. Sardeshmukh, and **K. Pegion** 2010, Realism of local and remote feedbacks on tropical sea surface temperatures in climate models, *J. Geophys. Res*., 115, D21110, doi:10.1029/2010JD013927.

Hu, Z. –Z, B. Huang, and **K. Pegion**, 2009: *Biases and the Most Predictable Patterns in the NCEP CFS over the Tropical Atlantic Ocean. Atlantic and Indian Oceans: New Oceanographic Research*, E. S. Askew and J. P. Bromley, Eds., Nova Science Publishers, Inc., 1-14.

Wu, R., B. P. Kirtman, and **K. Pegion**, 2008: Local rainfall-SST relationship on subseasonal time scales in satellite observations and CFS. *Geophys Res Letters*, 34, L22706, doi:10.1029/2008GL035883

Pegion, K. and B. P. Kirtman, 2008: The Impact of Air-Sea Interactions on the Simulation of Tropical Intraseasonal Variability. *J. Climate*, 21, 6616-6635.

Pegion, K. and B. P. Kirtman, 2008: The Impact of Air-Sea Interactions on the Predictability of the Tropical Intraseasonal Oscillation. *J. Climate*, 21, 5870-5886.

Hu, Z. -Z., B. Huang, and **K. Pegion,** 2008: Low Cloud Errors over the Southeastern Atlantic in the NCEP CFS and their Association with Lower-Tropospheric Stability and Air-Sea Interaction. *J. Geophys. Res.,* 113, D12114, doi: 10.1029/2007JD009514.

Hu, Z. -Z., B. Huang, and **K. Pegion**, 2008: Leading patterns of the tropical Atlantic variability in a coupled general circulation model. *Clim. Dyn,*, 30, 703-726.

Wu R., B. P. Kirtman, and **K. Pegion**, 2007: Surface latent heat flux and its relationship with sea surface temperature in the National Centers for Environmental Prediction Climate Forecast System simulations and retrospective forecasts, *Geophys. Res. Letters*, 34, L17712, doi:10.1029/2007GL030751.

Kirtman, B. P., **K. Pegion**, and S. Kinter, 2005: Internal atmospheric dynamics and Tropical Indo-Pacific Climate Variability. *J. Atmos. Sci*., 62, 2220-2233.

Wu, R., B. P. Kirtman, and **K. Pegion** 2005: Local Air-Sea Relationships in Observations and Model Simulations. *J. Climate*, 19, 4913-4932.

Smith, S.R., D. M. Legler, and **K.V. Verzone**, 2001: Quantifying Uncertainties in NCEP-Reanalysis Using High-Quality Research Vessel Observations. *J. Climate*, 14, 4062-4072.

Technical Reports & Extended Abstracts (not peer-reviewed)

Pegion, K., B. Kirtman, J. Huang, A. Mariotti, 2015: NMME Subseasonal Forecast System Exploratory Workshop Report.

Pegion, K. and R. Webb, 2013: An Assessment of Skill and Reliability of the NOAA Climate Forecast System and National Multi-Model Ensemble Prediction of Meteorological Conditions over the Missouri River Basin, Report to U.S. Army Corps of Engineers.

Pegion, K, P. Pegion, T. DelSole, and M. Sirbu, 2009: Subseasonal Variability of Hurricane Activity, NOAA Climate Testbed Joint Seminar Series Extended Abstracts. (http://www.nws.noaa.gov/ost/climate/STIP/FY09CTBSeminars/kpegion_121008.pdf)

Pegion, K., and B. P. Kirtman, 2007: Sensitivity of the MJO to SST: A Simulation and Predictability Study of the MJO using the CFS and GFS, NOAA Climate Testbed Joint Seminar Series Extended Abstracts. (http://www.nws.noaa.gov/ost/climate/STIP/CTB-COLA/kpegion_111407.htm)

Pegion, K. and B. P. Kirtman, 2007: Internal Atmospheric Dynamics and Air-Sea Interactions in the Tropical Intraseasonal Oscillation, COLA Technical Report #247, 20 pp. (ftp://cola.gmu.edu/pub/ctr/ctr_247.pdf)

Oberfield, M. A. and **K. V. Pegion**, 2002: Generating Digital Forecast Matrices from Gridded Forecasts in the Interactive Forecast Preparation System. *Preprints Interactive Symposium on the Advanced Weather Interactive Processing System (AWIPS),* Orlando, Amer. Meteor. Soc., (https://ams.confex.com/ams/annual2002/techprogram/paper_28112.htm)

PRESENTATIONS

Invited

Extratropical Precursors of the El Niño Southern Oscillation, Stony Brook University, School of Marine and Atmospheric Sciences Seminar, Apr 2016.

Extratropical ENSO Precursors: The Elephant of Long-lead ENSO Prediction, Dept of Atmospheric, Oceanic, and Earth Sciences Seminar, George Mason University, Feb 2016.

Development of a Subseasonal North American Multi-Model Ensemble Prediction System, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 2015.

The North American Multi-model Ensemble: Seasonal to Subseasonal Prediction, Workshop on Subseasonal Predictability, European Center for Medium Range Weather Forecasting, Reading, UK, Nov 2015.

NMME Subseasonal Demonstration Experiment, NMME Subseasonal Exploratory Workshop, National Centers for Environmental Prediction, College Park, MD, March 2015.

Towards Subseasonal Prediction with the NMME, 2nd Taiwan West Pacific Global Forecast System Planning Workshop, Central Weather Bureau, Taipei, Taiwan, May 2014.

Metrics for Quantifying Predictability limits, US CLIVAR Summit, Denver, CO, July 2014.

Untangling ENSO Precursors, Department of Geological Sciences, University of Indiana, Bloomington, Indiana, Mar 2013.

Untangling ENSO Precursors, Department of Atmospheric, Oceanic, and Earth Sciences, George Mason University, Fairfax, VA, Mar 2013.

Untangling ENSO Precursors, Dept of Meteorology, University of Oklahoma, Norman, OK.

The Seasonal Footprinting Mechanism in CFSv2: Simulation and Impact on ENSO Prediction,

COLA Seminar Series, Calverton, MD, 2013.

Prospects for Improving Seasonal Predictions, COLA Seminar Series, Calverton, MD, 2011.

The Impact of Air-Sea Coupling on Tropical Intraseasonal Variability, Simulation and Predictability, Penn State University, Earth Science System Center Seminar Series, State College PA, 2007.

Contributed (as lead author)

Untangling ENSO Precursors, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 2014.

Untangling ENSO Precursors, 39th Annual Climate Diagnostics and Prediction Workshop, St. Louis, Missouri, Oct 2014.

Forecasting Forecast Skill: Can an ENSO Conditional Skill Mask Improve Seasonal Predictions? NOAA Climate Program Office, Modeling Analysis Predictions and Projections Program Webinar on Intraseasonal to Interannual Prediction, 2013.

The Seasonal Footprinting Mechanism in CFSv2: Simulation and Impact on ENSO Prediction, Joint Climate Testbed Seminar Series, National Centers for Environmental Prediction, College Park, MD, 2013.

A Preliminary Assessment of MJO Skill in the NMME, 38th Climate Diagnostics and Prediction Workshop, College Park, MD, 2013.

The Seasonal Footprinting Mechanism in CFSv2: Simulation and Impact on ENSO Prediction, Clivar ENSO Diversity Working Group Workshop, Boulder, CO, 2013

The Seasonal Footprinting Mechanism in CFSv2: Simulation and Impact on ENSO Prediction, AGU Fall Meeting, San Francisco, CA, 2012

A Conditional Skill Mask for Improved Seasonal Predictions, 37th Climate Diagnostics and Prediction Workshop, Ft. Collins, CO, 2012

The Seasonal Footprinting Mechanism in CFSv2: Simulation and Impact on ENSO Prediction, CFSv2 Evaluation Meeting, poster, College Park, MD, 2012.

Understanding the Statistics of Climate Extremes, poster, AGU Fall Meeting, San Francisco, CA, 2011

Understanding the Statistics of Climate Extremes, poster, World Climate Research Programme, Open Science Conference, Denver, CO, 2011.

Multimodel Ensemble Prediction on Intraseasonal Timescales, poster, World Climate Research Programme, Open Science Conference, Denver, CO, 2011.

Prospects for Improving Seasonal Predictions, National Centers for Environmental Prediction, Climate Prediction Center, Development Branch Seminar, Camp Springs, MD, 2011.

Understanding the Statistics of Climate Extremes, NCAR/CCSM Workshop, poster, Breckenridge, CO, 2011.

Understanding the Statistics of Climate Extremes, 36th Climate Diagnostics and Prediction Workshop, Ft. Worth, TX 2011.

Multi-Model Ensemble Prediction on Intraseasonal Timescales, 36th Climate Diagnostics and Prediction Workshop, Ft. Worth, TX, 2011.

Prospects for Improving Subseasonal Predictions. 35th Climate Diagnostics and Prediction Workshop, Raleigh, NC, 2010

Subseasonal Variability of Hurricane Activity, NOAA Climate Testbed Joint Seminar Series, Calverton, MD, 2009.

Simulation and Forecast of Subseasonal Variability of Hurricane Activity, 33rd Annual Climate Diagnostics and Prediction Workshop, Lincoln NE, 2008.

The Impact of Air-Sea Coupling on Predictability of Boreal Winter/Spring Precipitation in the Indo-Pacific, 88th Annual AMS Meeting, New Orleans, LA, 2008.

Sensitivity of MJO Predictability to SST, 32nd Climate Diagnostics Workshop, Tallahassee, FL, 2007

Sensitivity of MJO Predictability to SST, poster, New Approaches to Understanding, Simulating, and Forecasting the Madden- Julian Oscillation, Irvine, CA, 2007.

Sensitivity of the MJO to SST: A Simulation and Predictability Study of the MJO using the CFS and GFS, Joint Climate Test Bed Seminar Series, Calverton, MD, 2007.

The Impact of Air-Sea Coupling on Tropical Intraseasonal Variability, Simulation and Predictability, Global Modeling and Assimilation Office Subseasonal to Decadal Group Seminar, Goddard Space Flight Center, Greenbelt, MD, 2007

The Impact of Air-Sea Coupling on Tropical Intraseasonal Variability in the CFS, poster, 31st Annual Climate Diagnostics and Prediction Workshop, Boulder, CO, 2006.

Interannual and Intraseasonal Variability in the CFS Interactive Ensemble, poster, 31st Annual Climate Diagnostics and Prediction Workshop, Boulder, CO, 2006

Potential Predictability of Tropical Intraseasonal Variability in the NCEP Climate Forecast System, presentation, 2006 AGU Joint Assembly, Baltimore, MD, 2006.

Simulation of Tropical Intraseasonal Variability in the CFS, poster, 30th Annual Climate Diagnostics and Prediction Workshop, State College, PA, 2005

The Importance of Daily vs. Monthly SSTs in Seasonal Simulations, poster, 84th Annual AMS meeting, Seattle, WA, 2004.

TEACHING & MENTORING

Courses Taught
Spring 2015: Atmosphere-Ocean Interactions (George Mason University, CLIM 713)
Fall 2015: Topics in Climate Dynamics, Earth System Modeling (George Mason University, CLIM 759)
Spring 2017 (planned): Introduction to Global Climate Change Science (George Mason University, CLIM 102)

Postdoctoral Mentoring
Supervisor, GMU Postdoctoral Scientist, Christopher Selman (2015-)

Graduate Advising
Advisor, GMU Earth System Science M.S. Student Patrick Staton (2014-2016)
Advisor, GMU Climate Dynamics PhD Student Akiko Elders (2015-)
Advisor, GMU Climate Dynamics PhD Student Teresa Cicerone (2015-)

Committee Membership
Dissertation Committee Member, GMU Climate Dynamics PhD Student Holly Norton (2015-)
Dissertation Committee Member, GMU Climate Dynamics PhD Student Sara Amini (2015-)
Dissertation Committee Member, GMU Climate Dynamics PhD Student Ralph Getzandanner (2016-)

Undergraduate & High School Advising
Mentor, NOAA/Hollings Scholarship Student Kirsten Mayer (2016)
Mentor, NOAA/Hollings Scholarship Student Zachary Brooks (2014)
Mentor, Blair High School Magnet Program Internship Student Mihai Sirbu (2008)

RESEARCH PROPOSALS

Funded

Multi-model Ensemble Prediction with CFS and CCSM, NOAA/CPO, 2008-2011, $206K

A US National Multi-Model Ensemble ISI Prediction System, NOAA/CPO, FY12-13, $1.9M

Seasonal to Decadal-Scale Climate Predictions for Marine Resource Management, NOAA, FY13-15, $420K.

Subseasonal NMME Forecasts: Skill, Predictability, and Multi-model Combinations, FY14-16, $342K

Identifying and Assessing Gaps in Subseasonal to Seasonal Prediction Skill, NOAA/CPO, FY15, $70K

Accelerating Development of NOAA's Next-Generation Coupled System for Week-3 and Week-4 Weather Predictions, NOAA/NWS, 2015-2017, $402K

Developing a Real-Time Multi-Model Sub-Seasonal Predictive Capability, NOAA/CPO, $240K

Sub-Seasonal Prediction with CCSM4, NOAA/CPO, $102K

HONORS & AWARDS

- NOAA/Climate Prediction Center Certificate of Recognition for NMME Contribution
- NOAA/Meteorological Development Laboratory "cash in your account" bonuses
- Upsilon Pi Epsilon (Computer Science Honors Society)
- Chi Epsilon Pi (Meteorology Honors Society)
- Florida State University Liberal Studies Honors Program
- Florida State University Honors Scholarship
- Florida Academic Scholars Undergraduate Scholarship

SERVICE & PROFESSIONAL ACTIVITIES

Panels, Working Groups, Committees

- Member, US Clivar Scientific Steering Committee (2015-present)
- Member, US Clivar, Predictability, Prediction, Applications Interface Panel (2013-present)
- Co-Chair, US Clivar, Predictability, Prediction, Applications Interface Panel (2015-present)
- Member, NOAA/Climate Program Office Climate Prediction Task Force (2012-2015)
- Member, US Clivar MJO Working Group (2009-2010)
- George Mason University, Climate Dynamics Department, Recruitment Committee, Student Representative (2005-2007)

Reviewer

- Journals: Climate Dynamics, Journal of Climate, Journal of Geophysical Research, Geophysical Research Letters, Monthly Weather Review, Weather and Forecasting, EOS, Journal of Atmospheric Sciences
- Funding Agencies: National Science Foundation, NOAA/Climate Program Office, NASA

Conference Sessions & Workshops Organized

- Understanding and Predicting Subseasonal Extremes, Poster Cluster, Clivar Open Science Conference, Sep 2016
- US Clivar, PPAI Panel Meeting, Jul 2016
- Co-convener American Meteorological Society Annual Meeting Session, *Multi-model Predictability and Prediction on Subseasonal to Seasonal Timescales*, Jan 2016
- Co-convener American Geophysical Union Fall Meeting Session, *The El Niño - Southern Oscillation continuum*, Dec 2015
- US Clivar Summit Panel breakout sessions, Aug 2015
- NMME Subseasonal Forecast System Exploratory Workshop, Mar 2015

TECHNICAL SKILLS

Climate Models: NCEP CFSv1/v2, NCAR/CESM, NASA/GEOS5, SPEEDY
Programming: Fortran 77/90, C/C++, UNIX shell-scripting, Python, Java
Data Analysis: GrADS, IDL, Matlab, NCL

Operating Systems: Unix/Linux, Mac OSX, MS Windows
Web Development: html, css, bootstrap
Supercomputing Systems: NCAR, NOAA, NASA