

## **Interannual to multidecadal Arctic sea ice extent trends in a warming world**

Jennifer Kay <sup>†</sup>;

<sup>†</sup> NCAR, USA

Leading author: [jenkay@ucar.edu](mailto:jenkay@ucar.edu)

A climate model (CCSM4) is used to investigate the contribution of natural variability to Arctic sea ice extent trends. On all timescales examined (2-50 years), the most extreme negative observed 1979-2010 September trends cannot be explained by CCSM4 natural variability and natural transient forcing alone. Late 20th century CCSM4 ice extent loss also cannot be explained by natural causes alone, but the six available CCSM4 ensemble members exhibit a large spread in their late 20th century ice extent loss. Comparing trends from the six-member CCSM4 ensemble to observed trends suggests that natural variability has enhanced observed late 20th century ice loss. In a warming world, CCSM4 shows that multi-decadal negative trends increase in frequency and magnitude, and that trend variability on 2-10 year timescales increases. Furthermore, when natural variability counteracts anthropogenic forcing, positive trends on 2-20 year timescales occur until the middle of the 21st century.