

**From the Climate Science chapter of the National Climate Assessment
(to be released in late 2013):**

“Recent work has indicated that the loss of summer sea ice may be affecting the atmospheric circulation in autumn and early winter. For example, there are indications that a weakening of sub-polar westerly winds during autumn is an atmospheric response to a warming of the lower troposphere of the Arctic (Overland and Wang 2009). Extreme summer ice retreat also appears to be increasing the persistence of associated mid-latitude weather patterns, which may lead to an increased probability of extreme weather events that result from prolonged conditions, such as drought, flooding, cold spells, and heat waves (Francis and Vavrus 2012). *However, uncertainties remain about the effect on mid latitudes (Screen and Simmonds 2013) ... The combination of interannual variability and the small sample of years with extreme ice retreat make it difficult to identify a geographically consistent atmospheric response pattern in the middle latitudes.*”

A key challenge: interannual to multidecadal variability

Example: Oct-Dec mean zonal wind at 500 mb (30-80°N, 0-360°W), 1948-2012

