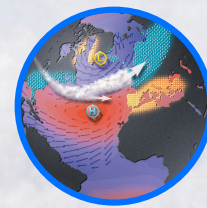
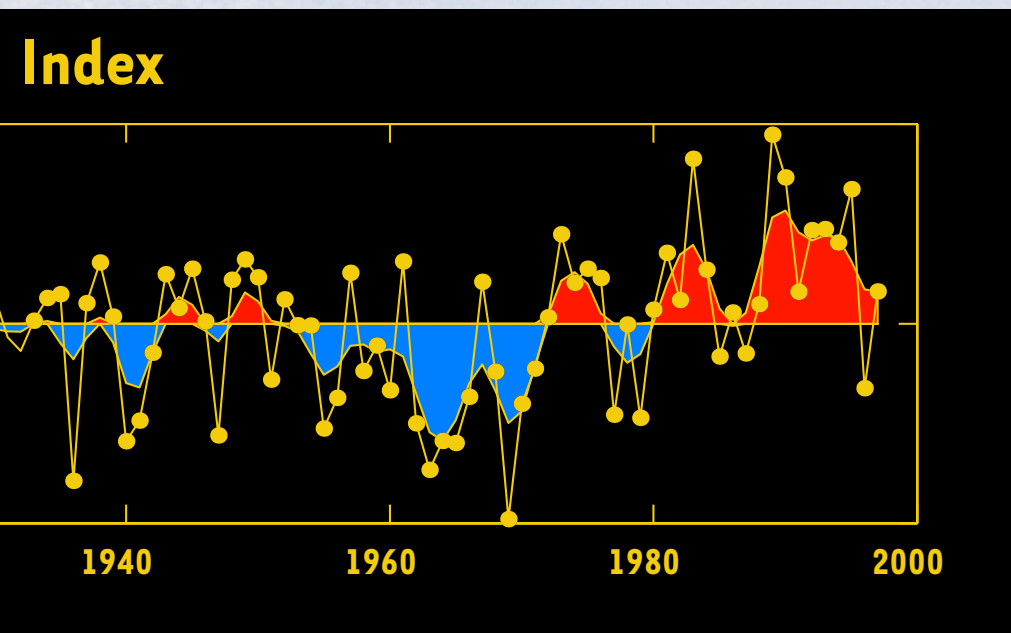


climate system, while the trend witnessed over the last 30 years may be caused by anthropogenic impacts such as ozone depletion and increased CO<sub>2</sub> emissions. One of the fundamental questions driving NAO-related research is:

How do these two influences, **natural** climate variability and **global warming**, interact?



POSITIVE  
NAO



NEGATIVE  
NAO

## ANTHROPOGENIC CHANGE

### NAO & Global Warming

Over the past thirty years, the NAO has steadily strengthened, rising from its low index state in the 1960s to a historic maximum in the early 1990s. This trend accounts for a significant portion of Northern Hemisphere wintertime temperature increase over Eurasia, a major component of the recent warming. Consequently, the NAO has made its way into the global warming debate.

More recently, scientists became aware of a connection between variations in temperature at the earth's surface and the strength of the stratospheric winter vortex, located about 60 km above the earth's surface. Changes in stratospheric circulation can be forced by several different mechanisms including ozone depletion, volcanic dust, and CO<sub>2</sub>. Rising CO<sub>2</sub> concentrations cool and strengthen the stratospheric winter vortex which translates into stronger surface winds. Enhanced surface westerly winds are consistent with a positive NAO index. These changes, which modulate the temperature over northern Eurasia and America, are sometimes referred to as the Arctic Oscillation.