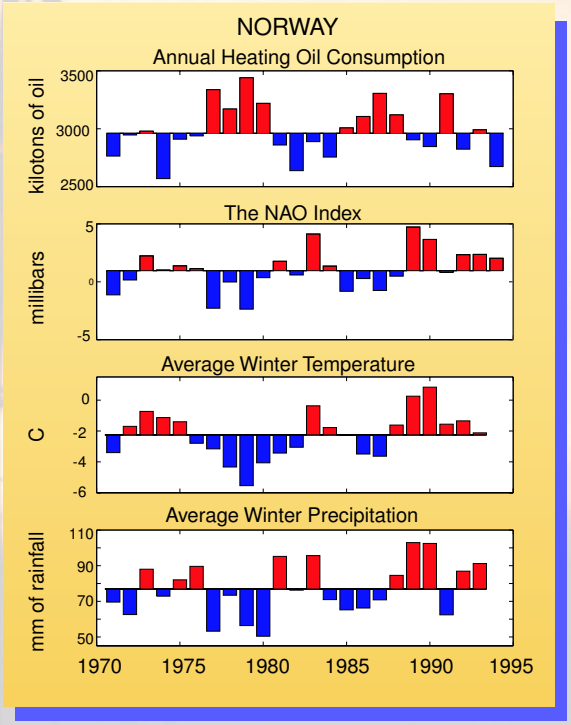
Human Impacts

ENERGY PRODUCTION & CONSUMPTION

US HYDROPOWER PRODUCTION

In the United States hydropower supplies 12% of the nation's electricity. Hydropower produces more than 90,000 megawatts of electricity, which is enough to meet the needs of 28.3 million consumers. Hydropower accounts for over 90% of all electricity that comes from renewable resources (such as solar, geothermal, wind and biomass).

A primary goal of reservoir operators at hydropower facilities is optimizing flood protection vs. energy generation. If reservoir operators underestimate flood volume, the reservoir system will be unable to fully regulate flow. As a result, water must be spilled over into spillways. Environmental damage due to flooding and financial loss due to decreased generating capacity result. The link between a positive NAO and increased East Coast precipitation suggests that reservoir operators in this region could gain from knowing more about the NAO.



ENERGY CONSUMPTION AND PRODUCTION IN NORWAY AND THE NAO

The demand for heating oil in Norway clearly shows human sensitivity to changes in the NAO. Cooler winters and a generally negative NAO prevailed during the late 1970's resulting in a greater demand for heating oil. Things changed in the early 1980's as the NAO index switched to a positive phase and Norway became warmer, resulting in decreased demand for heating oil. These changes in demand vary by 10-15% of the average demand between 1970 - 1995.

Norway is the world's sixth largest hydropower producer, and the largest producer of hydropower in Europe. Annual winter precipitation in Norway can be thought of as a surrogate for streamflow and hence hydropower generation. Between 1980 and 1993, a period of increasingly positive NAO years, precipitation was higher than normal, resulting in increased water inflow for power generation.