Solar soft X-ray irradiance is extremely variable and significantly affects space weather by increasing the energy deposition to the upper atmosphere. It provides an energy source to the lower thermosphere and ionosphere for the production of photoelectrons that produce E-region ionization, dissociation of molecules, and airglow emissions. Solar flares are a dramatic source of variability. Nitric oxide (NO) is an important product of the solar energy deposition, and is key to the energetics of the lower thermosphere as it provides the primary cooling process there.

**REFERENCES**