

**ESS 431 PRINCIPLES OF GLACIOLOGY**  
**ESS 505 THE CRYOSPHERE**

**Lecture 11 – Paleoclimate and Ice Ages I: Ice core science and climate reconstruction.**

*Due Monday, November 13 2017, at start of class*

Jouzel, J., 2013. A brief history of ice core science over the past 50 years *Climate of the Past* Vol. 9,  
2525–2547.

1. Where is Vostok, and what characteristics of the environment there make this a good site for a long paleoclimate record?
2. What geochemical signal is used as a proxy for air temperature in the past?
3. Estimate the temperature change implied by a change of 10 per mil in  $d^{18}O$ .
4. How has  $CO_2$  in the atmosphere varied over the past 800,000 years?
5. Does  $CO_2$  vary in phase with the temperature variations at the Vostok ice core?