

Figure S1. Solar zenith angle and the weekly snow accumulation observations at Summit, Greenland. The thick black curve represents the average over the 5 years, and others were the observations in each year from 2003-2007.

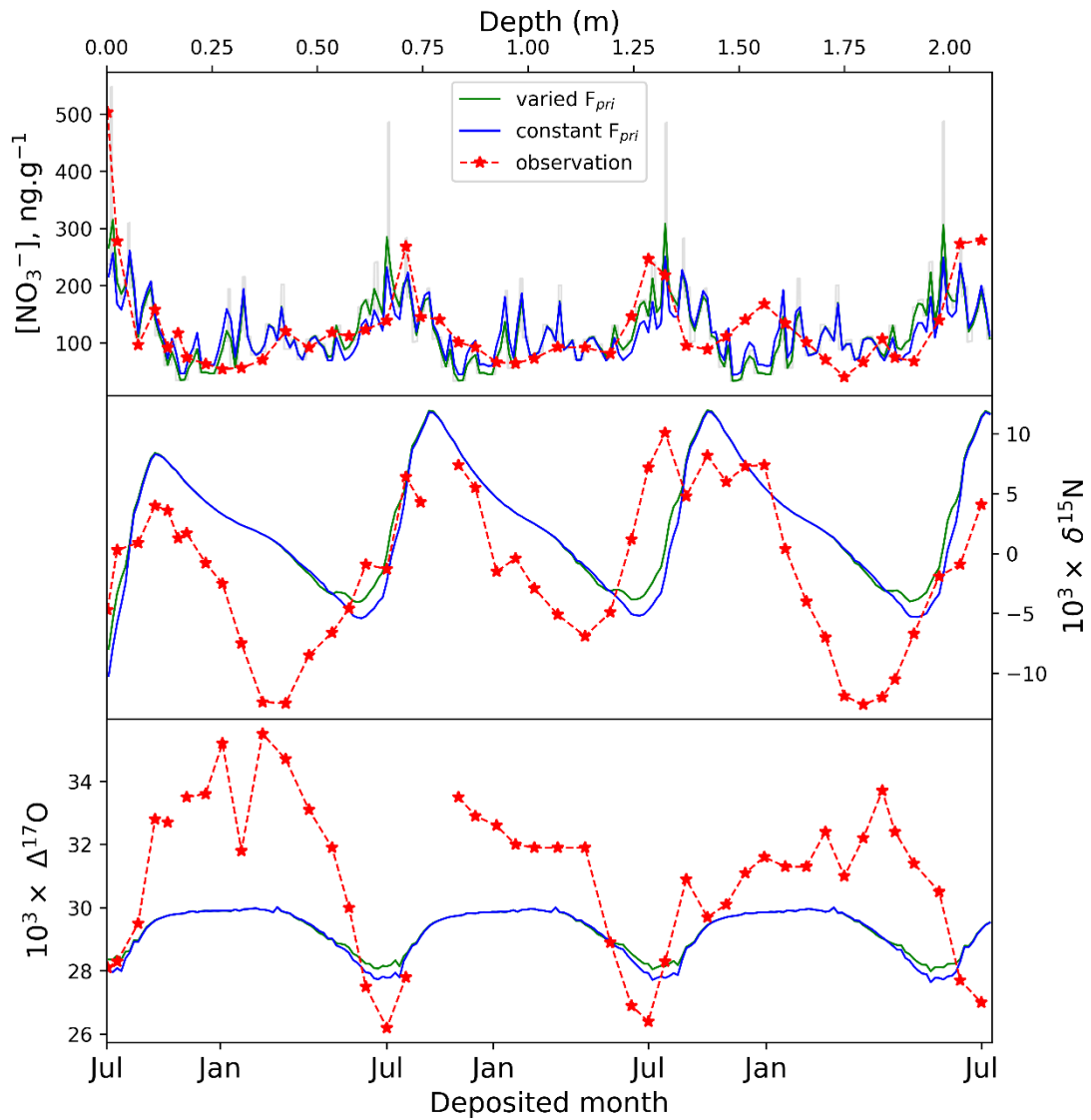


Figure S2. The impact of choosing different F_{pri} on modeled snow nitrate profiles. Varied F_{pri} : using seasonally-varied F_{pri} as seen in Figure 1a. Constant F_{pri} : using constant F_{pri} throughout the year. Note the annual amount of F_{pri} was kept same in these two scenarios.

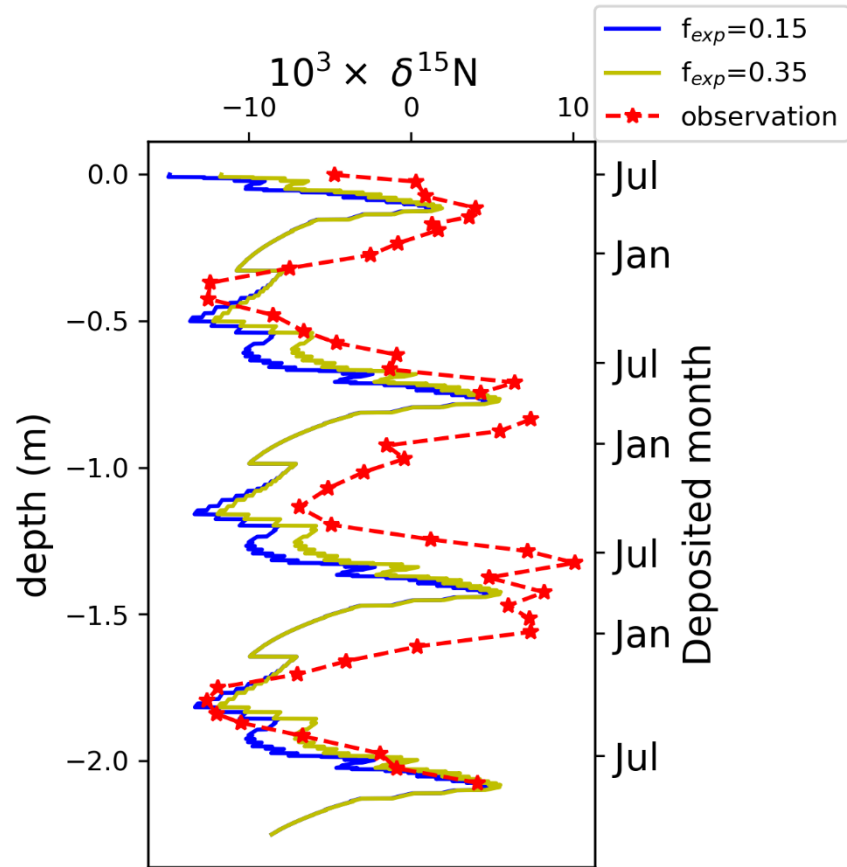


Figure S3. The modelled seasonal $\delta^{15}\text{N}(\text{NO}_3^-)$ with different f_{exp} (the export fraction).