

## **Description of Additional Supplementary Files**

File name: Supplementary Data 1:

Description: Compilation of subducting slab specific water and carbon fluxes

File name: Supplementary Data 2:

Description: Subducting slab specific carbon recycling

File name: Supplementary Data 3:

Description: Comparison of carbon recycling efficiency with CO<sub>2</sub> outputs from strong emitter volcanoes