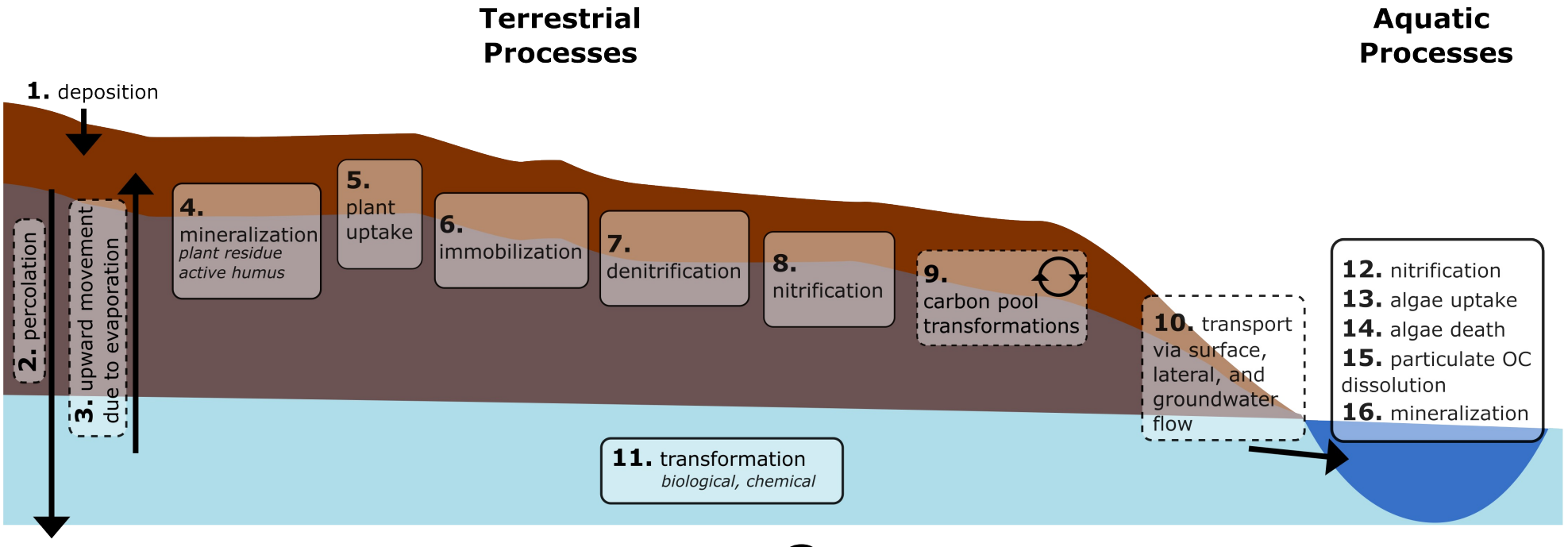
a



b

Process	Controlling Factors
1. Deposition (wet and dry)	-
2. Percolation	water flow, saturated water content, $[NO_3^-]$*
3. Upward movement due to evaporation	evaporation, saturated water content, $[NO_3^-]$*
4. Mineralization (soils)	saturated water content, soil temperature†, $[NO_3^-]$*, [P]*
5. Plant uptake	plant demand†, $[NO_3^-]$*
6. Immobilization	$[NH_4]$*, plant C:N ratio*
7. Denitrification	saturated water content, soil temperature†, soil carbon*, $[NO_3^-]$*
8. Nitrification	saturated water content, $[NH_4]$*
10. Transport via surface, lateral flow, groundwater flow	water flow, $[NO_3^-]$*
11. Transformation	-
12. Nitrification (stream)	travel time†, water temperature*, stream oxygen content*, $[NH_4]$*
13. Algae uptake	algae biomass and growth*

c

Process	Controlling Factors
2. Percolation	water flow, saturated water content, soil bulk density, [DOC]*, microbial biomass*
4. Mineralization (soils)	soil texture*
9. Carbon pool transformations	saturated water content, soil temperature†, soil texture*
10a. Transport via surface and lateral flow	water flow, saturated water content, soil bulk density, [DOC]*, microbial biomass*
10b. Transport via groundwater flow	water flow, [DOC]*
14. Algae death	travel time†, water temperature*, algae biomass and growth*
15. Particulate OC dissolution	travel time†, water temperature*, [particulate OC]*
16. Mineralization (stream)	travel time†, water temperature*, [DOC]*