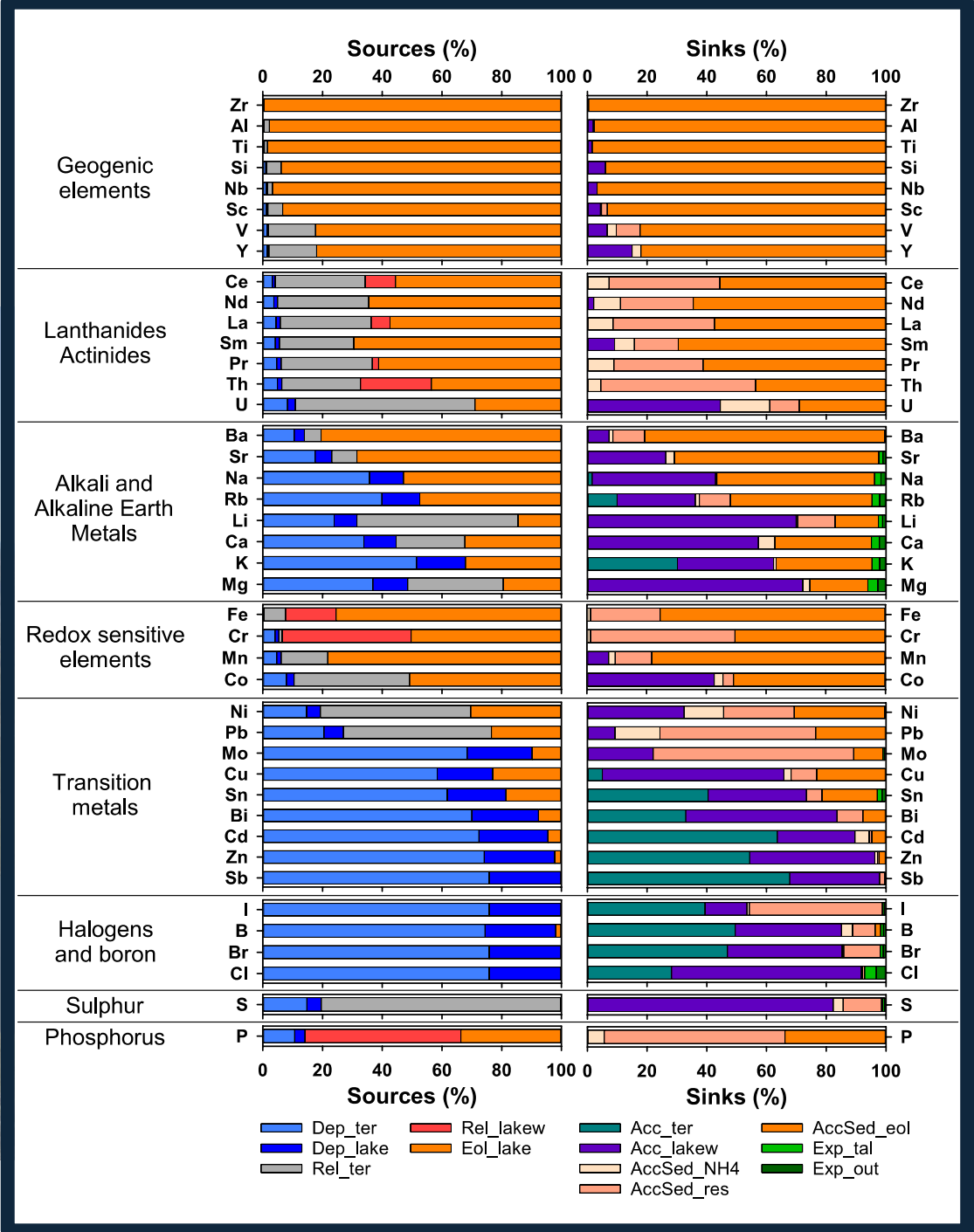
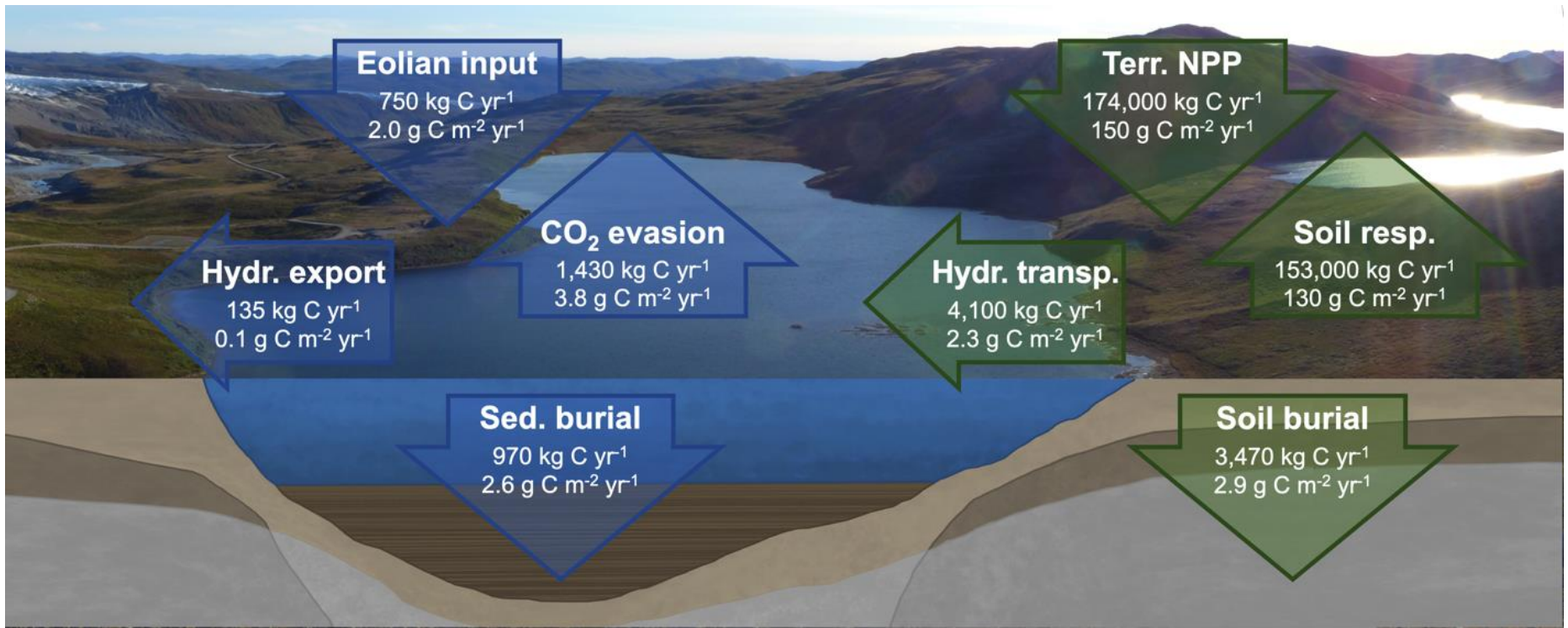


Biogeochemical cycling (RP3)





Eolian input

750 kg C yr⁻¹
2.0 g C m⁻² yr⁻¹

Terr. NPP

174,000 kg C yr⁻¹
150 g C m⁻² yr⁻¹

CO₂ evasion

1,430 kg C yr⁻¹
3.8 g C m⁻² yr⁻¹

Soil resp.

153,000 kg C yr⁻¹
130 g C m⁻² yr⁻¹

Hydr. export

135 kg C yr⁻¹
0.1 g C m⁻² yr⁻¹

Hydr. transp.

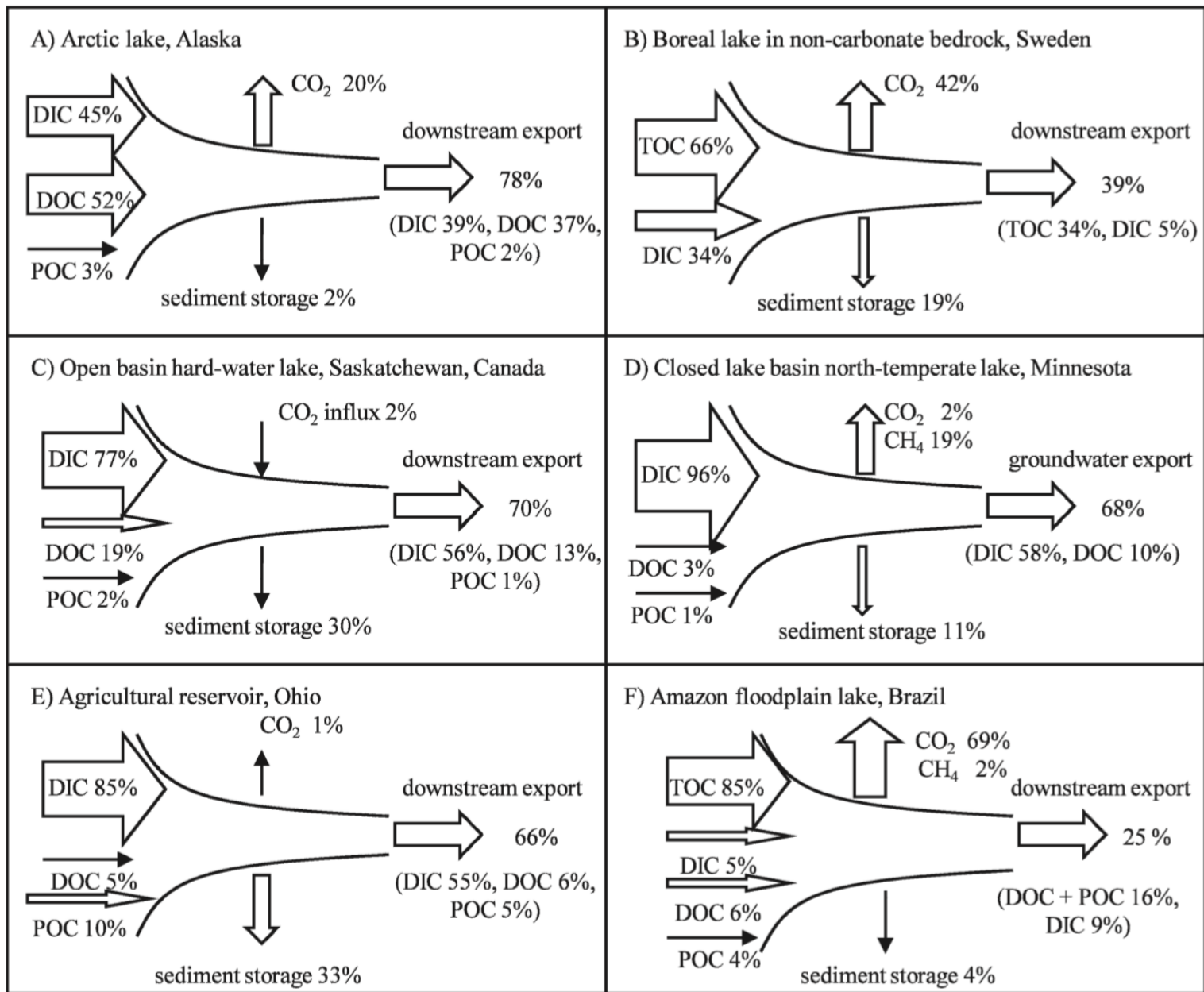
4,100 kg C yr⁻¹
2.3 g C m⁻² yr⁻¹

Sed. burial

970 kg C yr⁻¹
2.6 g C m⁻² yr⁻¹

Soil burial

3,470 kg C yr⁻¹
2.9 g C m⁻² yr⁻¹



Research questions/tasks

How does the biogeochemical cycling change along the climate gradient TBL-Wolf Creek-Krycklan-Forsmark

- a. Compare available data – are there any differences in the abundance of different key elements or element groups
- b. Simple mass-balance modelling using fluxes from the hydro models – both absolute transport and relative importance of different pathways (focus on key elements), as well as, the importance of different sources and sinks?

Are there any differences in the seasonal variability due to differences in the climate?

- a. What patterns seasonal temporal variability can we see in the data that we have, are there any differences between sites?
- b. Calculate the flux of elements for different years and seasons/events (based on the hydrological modelling) to complement the assessment of variations in concentrations.
- c. Couple temporally resolved hydrological modelling with the water chemistry data (stream and lysimeters). Can we detect any patterns that can help our understanding regarding how high/low-flow situations affect the chemistry?

What are the influence of non-steady state situations on biogeochemical cycling under different climate?

- a. Conceptual understanding about the effect of PTZ, altered flow paths (mineral soil vs. organic layer) and drainage/flooding.
- b. Look at how stored pollution elements like Pb, S and Hg – which are currently a non-steady state situation – behave in the present-day landscape.
- c. Use lake sediments to look at long-term trends
- d. Modelling based on a gradual removal of permafrost and increased precipitation

Is it the temperature or precipitation that is the main driver of differences between climate settings (e.g., TBL and Forsmark)?

- a. Run coupled biochem.-hydro. models for each site under the climatic conditions of the other sites in order to study how catchment characteristics (e.g., soil type, topography, number of streams and lakes) modulate the effect of climate.

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