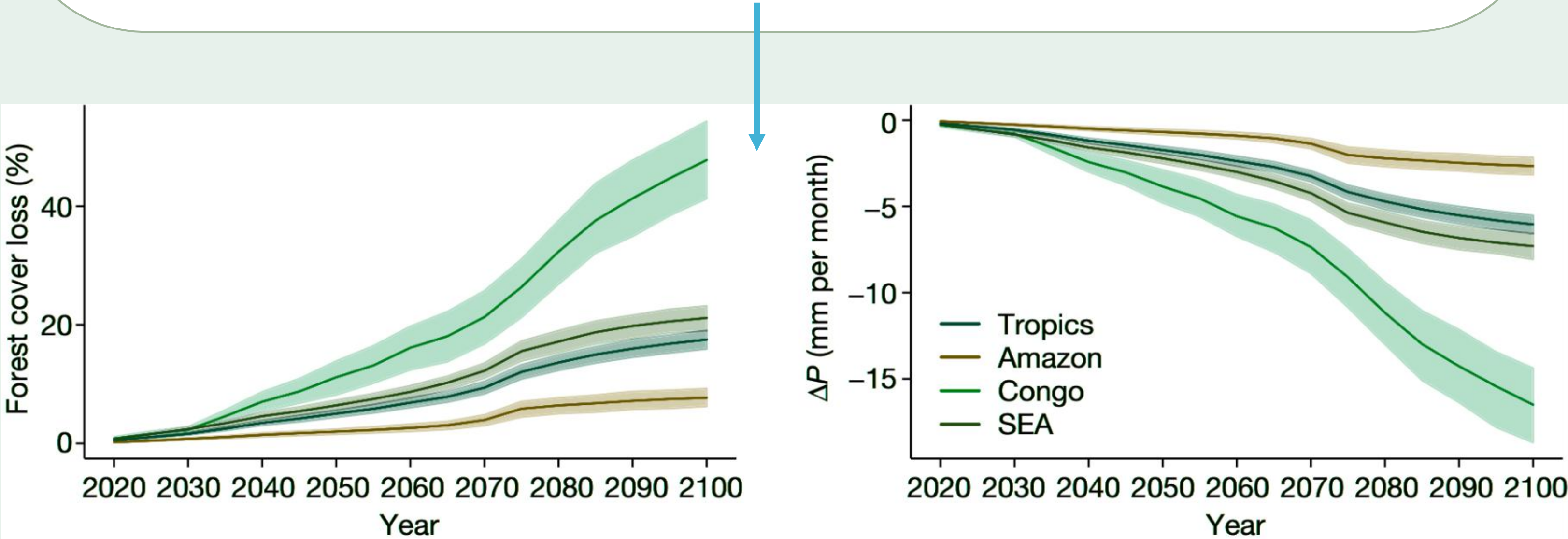


Hydrological responses of the Congo Basin to deforestation

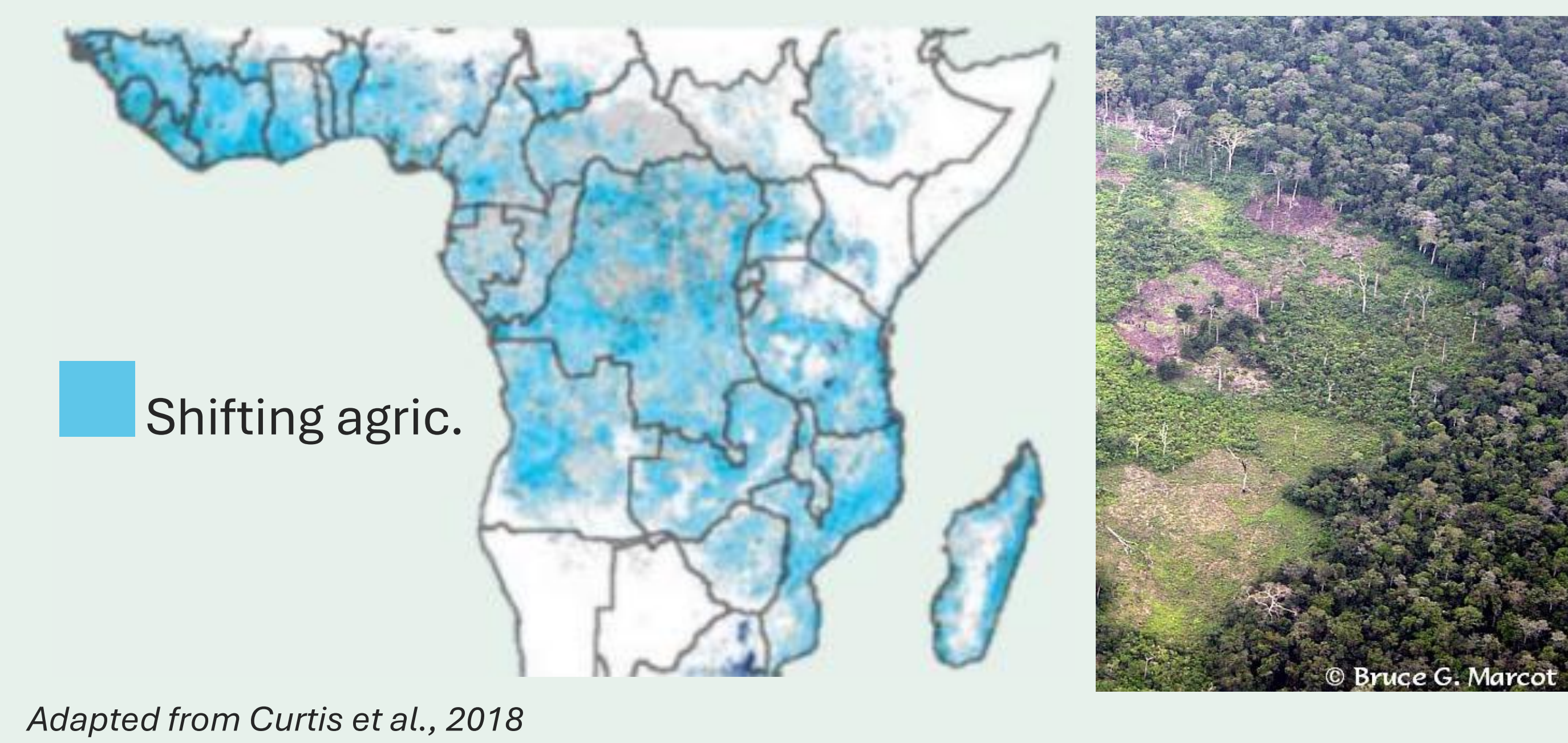
Scientific background: Congo Basin

- Hosts the **2nd largest tropical forest** and plays crucial roles in hydrological cycles, thereby influencing the climate.
- The region functions **near the lower precipitation threshold (1500mm)** for its stability, making it vulnerable for structural and compositional shifts under future drying.
- It is **increasingly impacted by climate- and land use change**: prolonged dry season and extreme temperatures observed.
- **Shifting agriculture** is the main driver of deforestation.
- Expected to have the **highest tropical deforestation rates**, associated with decreased precipitation¹.



Knowledge gaps & problems

- **Lack of observations**: it remains one of the least studied major river basins worldwide.
- **Limited model** development and validation.
- The **contribution of deforestation** to hydrological trends not well understood.
- Uncertain if the tropical forests of the Congo Basin will reach a **tipping point** under future climate change and deforestation.



Methods

2 paired research sites: forested & deforested plot

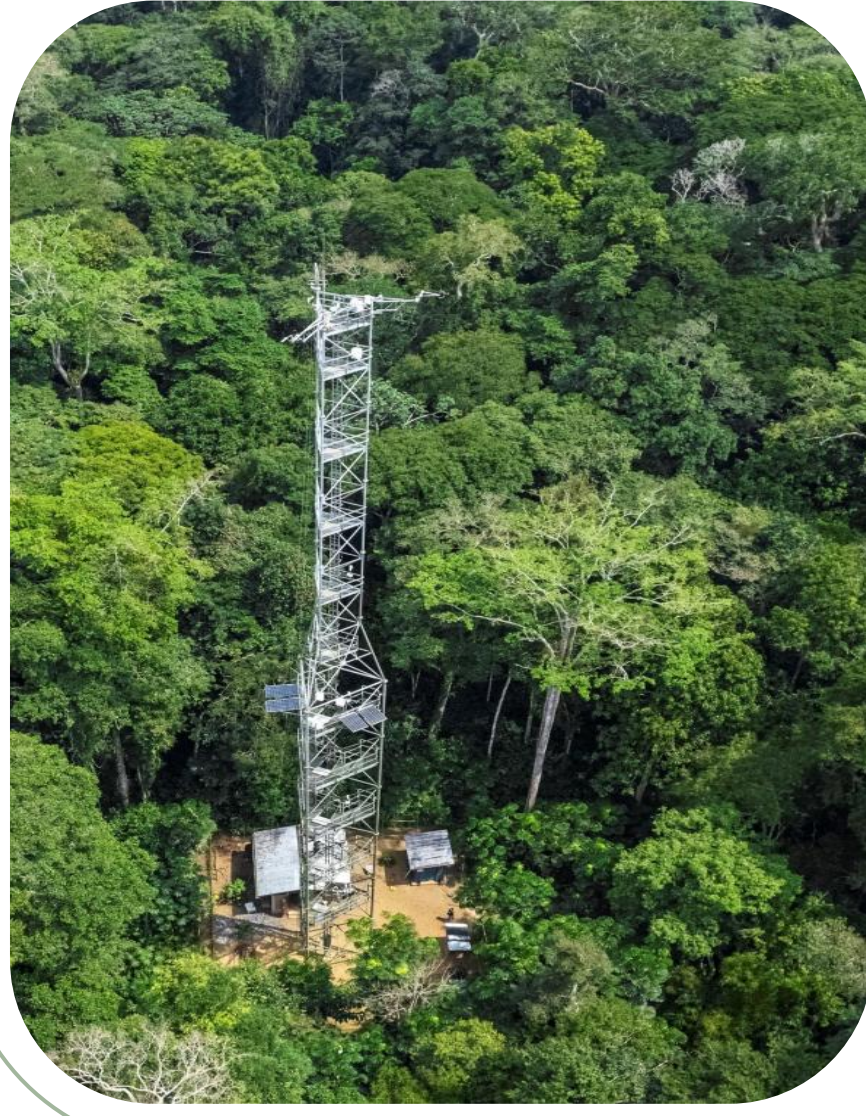
- Seasonally dry Miombo forest
- Mixed lowland rainforest

Hydrological measurements:



Yangambi (DRC)

CongoFlux



CongoAgriFlux



Sakania (DRC)

MiomboFlux



MiomboAgriFlux



Future objectives

- Eddy-covariance data treatment and evapotranspiration driver identification: VPD, SM, ...
- Comparative study to quantify how small-scale deforestation impacts hydrological fluxes (incl. ET, SM, discharge) in the Congo Basin, while accounting for forest type:
 - Forest type: CongoFlux ↔ MiomboFlux
 - Deforestation: CongoFlux ↔ CongoAgriFlux, MiomboFlux ↔ MiomboAgriFlux
- Use this dataset to improve a state-of-the art land surface model for the region

Contact

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