Peat merge meeting

31/01/2022

Where is the trunk now


Courtesy of P. Peylin
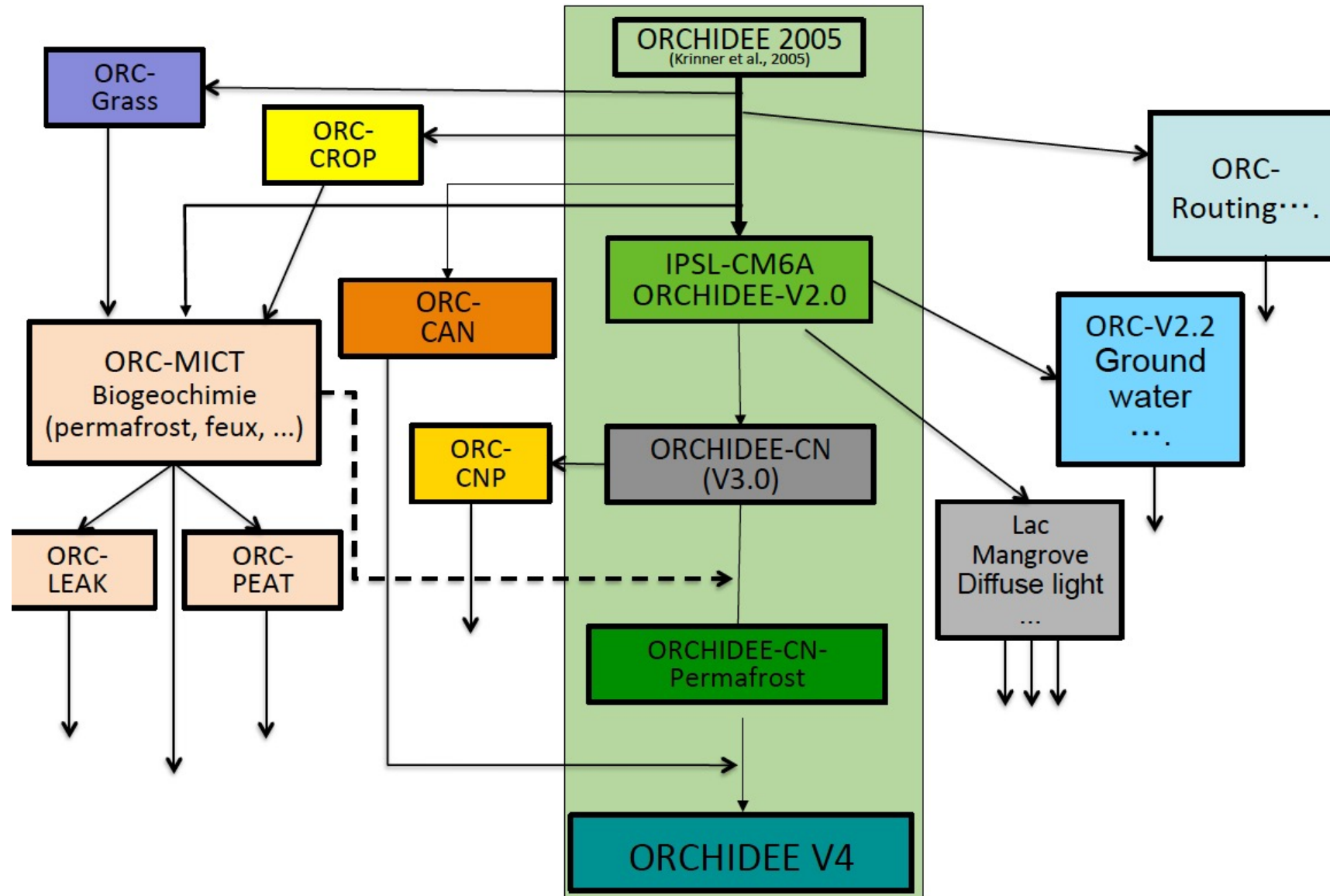
Where is the trunk now
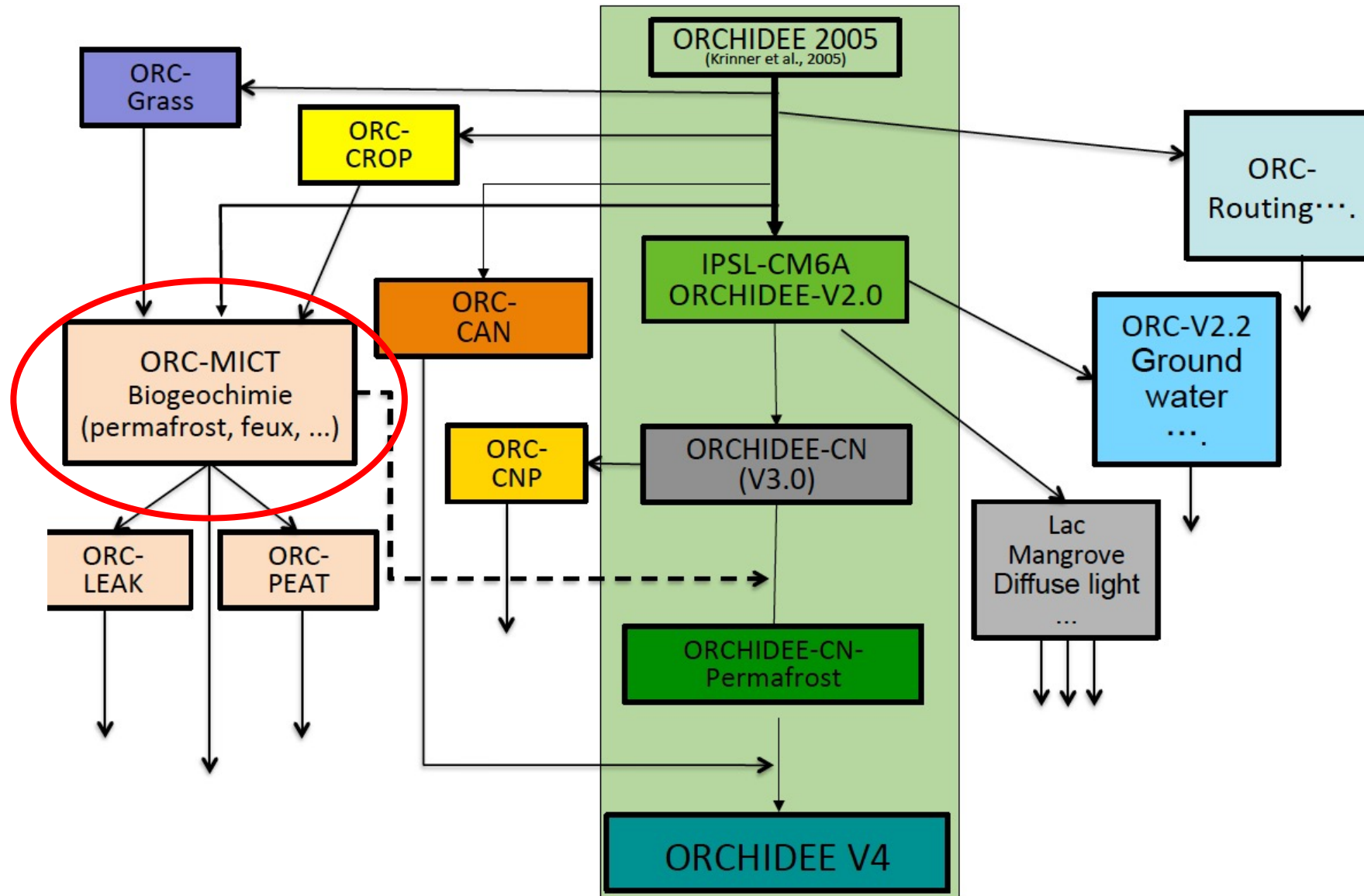
What do we implement in the trunk from MICT?

- Several options are available in MICT but not in the trunk (fire, grassland management, permafrost C)

- Focus on permafrost C

- Not only adding « frozen C »

- Soil C is discretized
- Diffusion is added (including bioturbation and cryoturbation)
- Temperature effect on SOC mineralization
- When frozen, nroot is set to -> impact on water stress and on transpiration.
- Optional
  - Zimov effect
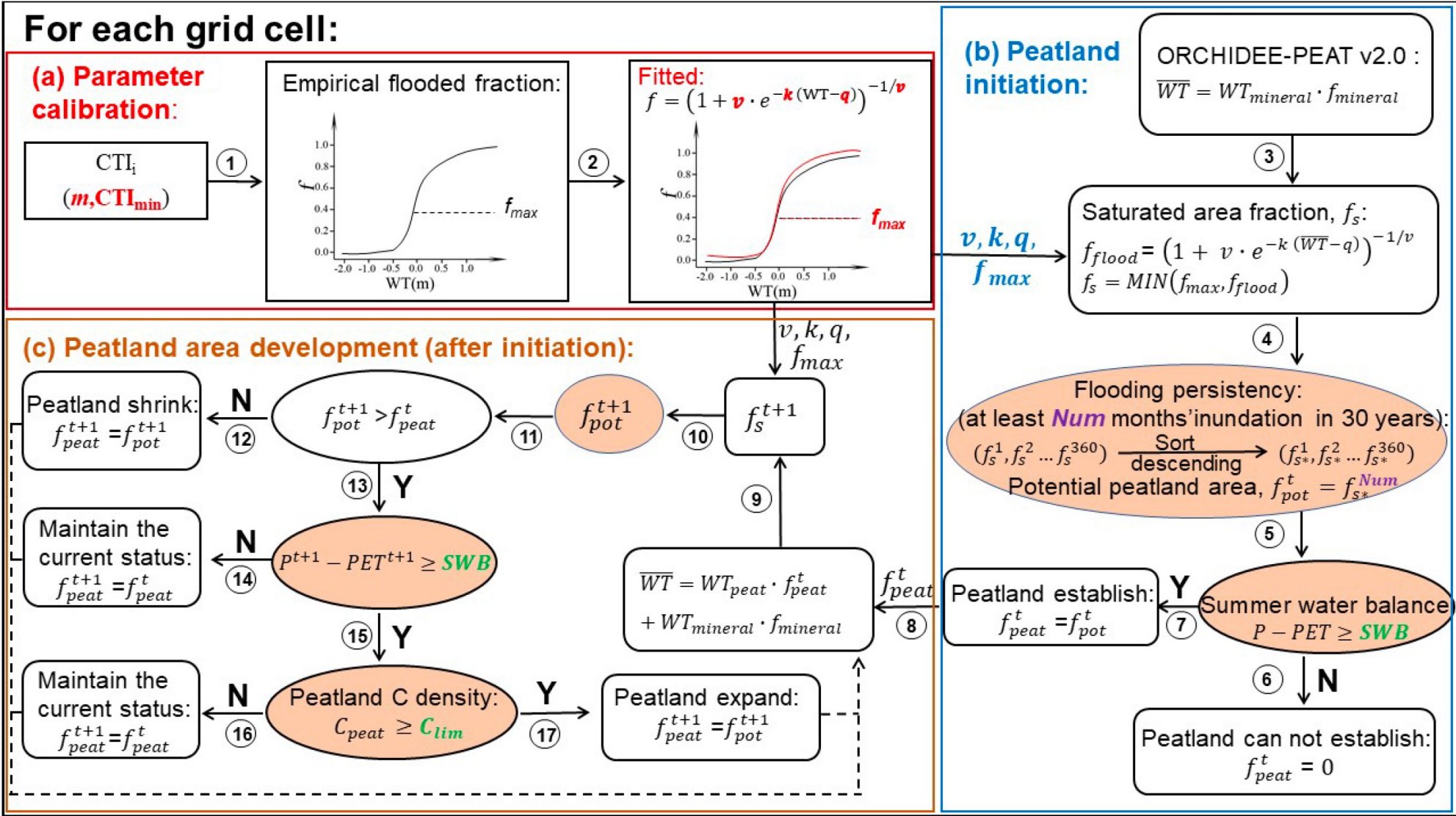 - Insolation effect (thermal conductivity affected by SOC)

Having the peat in the trunk?

- Impact on hydrology and biogeochemistry

- Having new PFT (at least one)

- An adapted spinup is needed?

- The role of N?

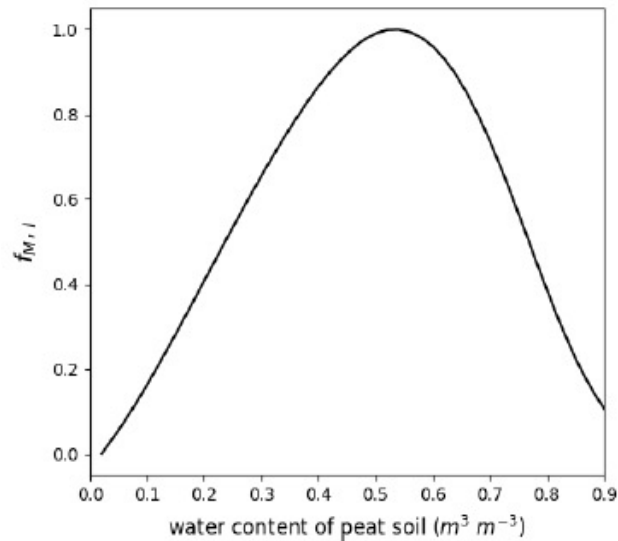# Having the peat in the trunk: the hydrology?

Qiu et al 2018

Having the peat in the trunk: the hydrology?

Qiu et al 2019
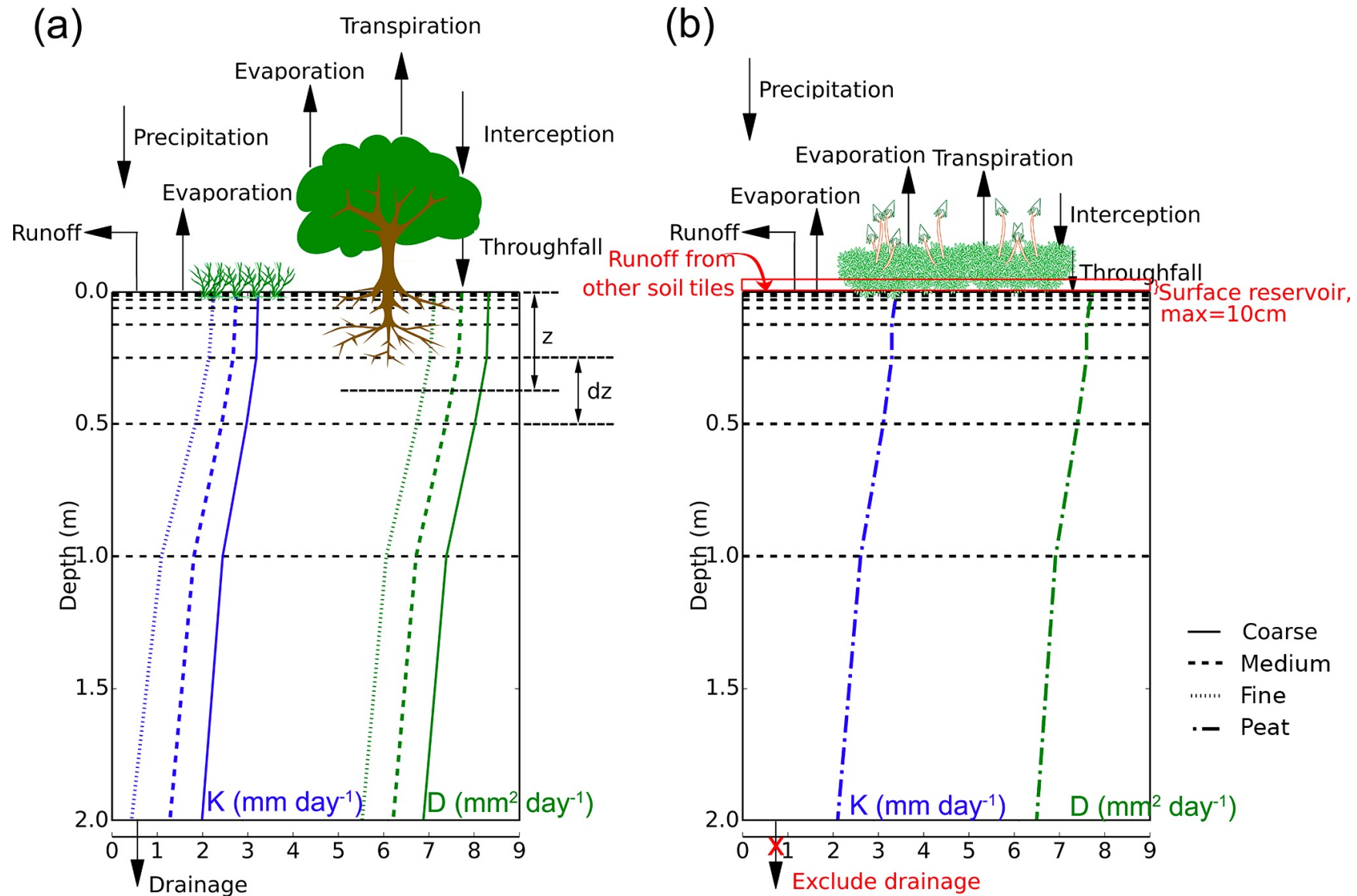
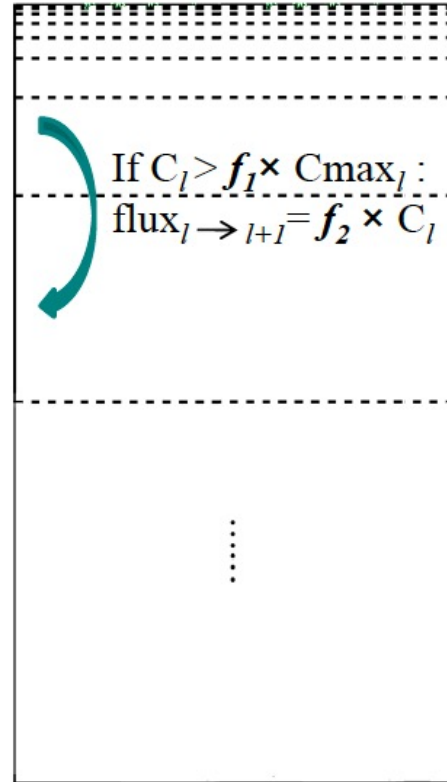# Having the peat in the trunk: the soil biogeochemistry?

$$k_{i,l} = k_{0,i} \times f_{T,l} \times f_{M,l} \times f_{Z,l}$$

$f_{M,l}$: moisture modifier

Moyano et al., 2012

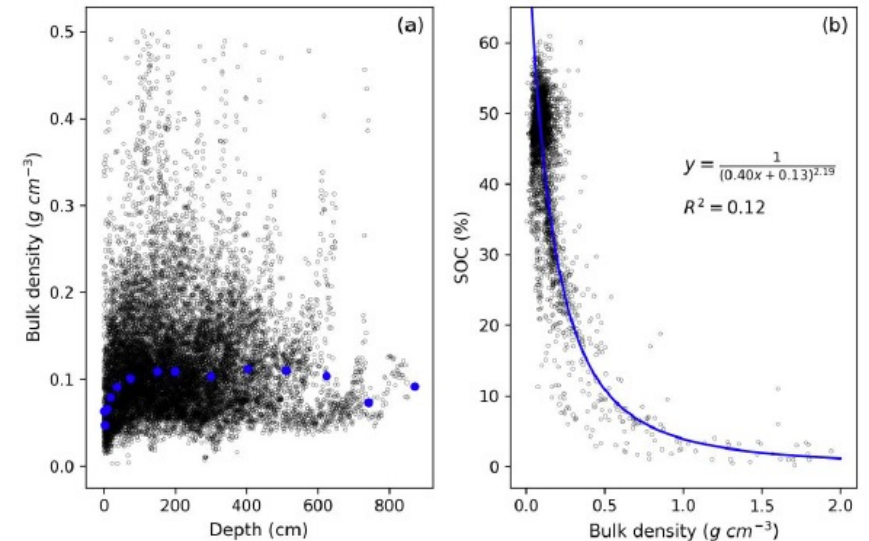Peat carbon accumulation— downward movement of carbon

If $C_l > f_1 \times Cmax_l$:
$flux_{l \rightarrow l+1} = f_2 \times C_l$

$$Cmax_l = BD_l \times fC_l \times \Delta Z_l$$

BD_l: the soil bulk density of the layer l (kg m^{-3})
fC_l: the fraction of carbon in layer l
ΔZ_l: the thickness of the layer l (m)

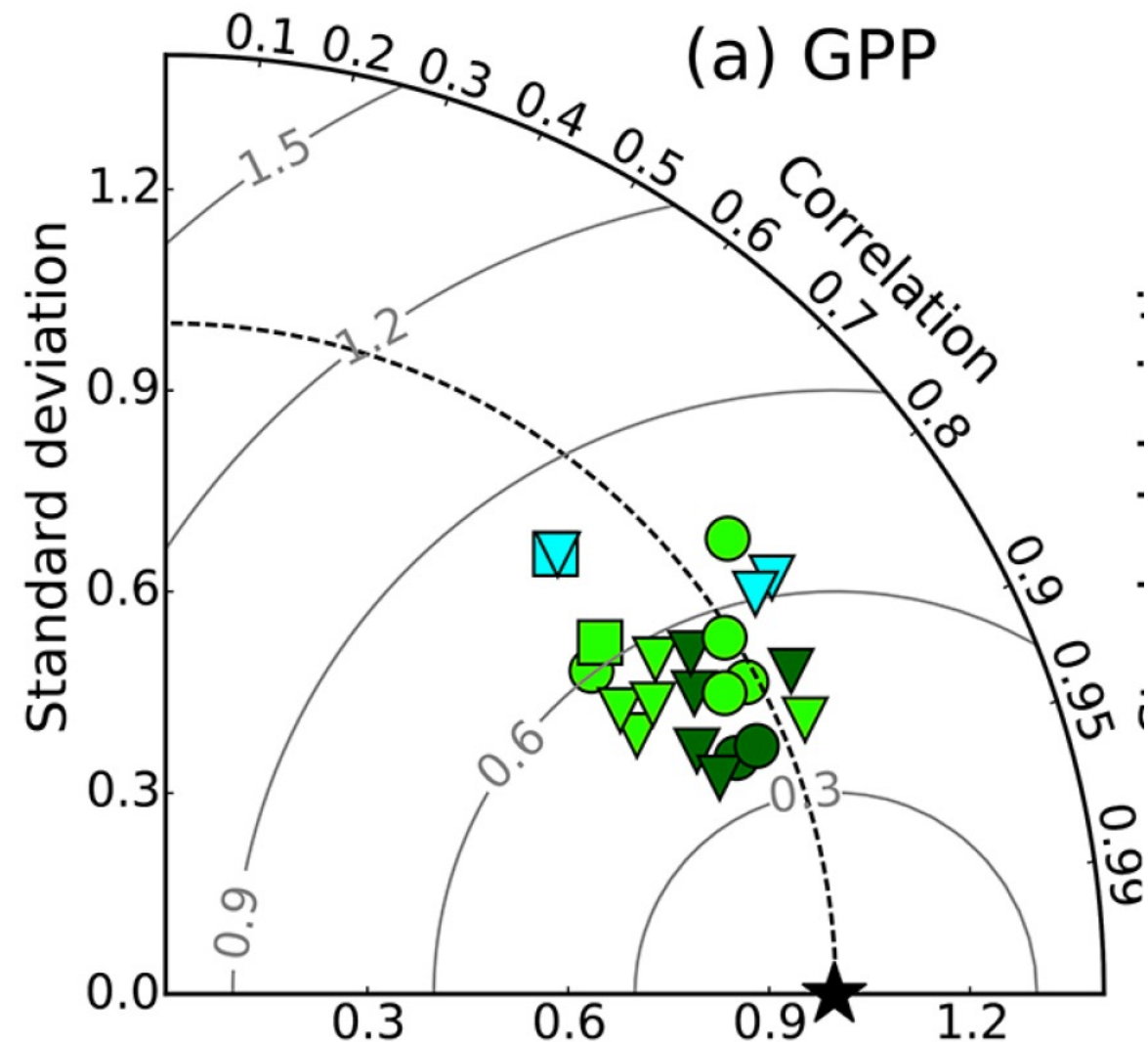$y = \frac{1}{(0.40x + 0.13)^{2.19}}$

$R^2 = 0.12$

Qiu et al 2019

Having the peat in the trunk: new PFTs?

Table 3. Optimized V_{cmax} ($\mu mol\,m^{-2}\,s^{-1}$) at each site

Site	V_{cmax}	Site	V_{cmax}
US-WPT	80	FI-Sii	19
CA-Mer	25	DK-NuF	31
US-Los	65	SE-Deg	23
DE-Sfn	45	US-Bog	42
CZ-Wet	54	US-Fen	56
DE-Spw	89	FI-Lom	28
IE-Kil	28	RU-Che	35
DE-Bou	34	NO-And	21
DE-Zrk	33	DK-ZaF	37
CA-Wp1	38	NO-Adv	28
SE-faj	21	PL-Kpt	52

(a) GPP

Qiu et al 2018

Having the peat in the trunk: an adapted spinup?
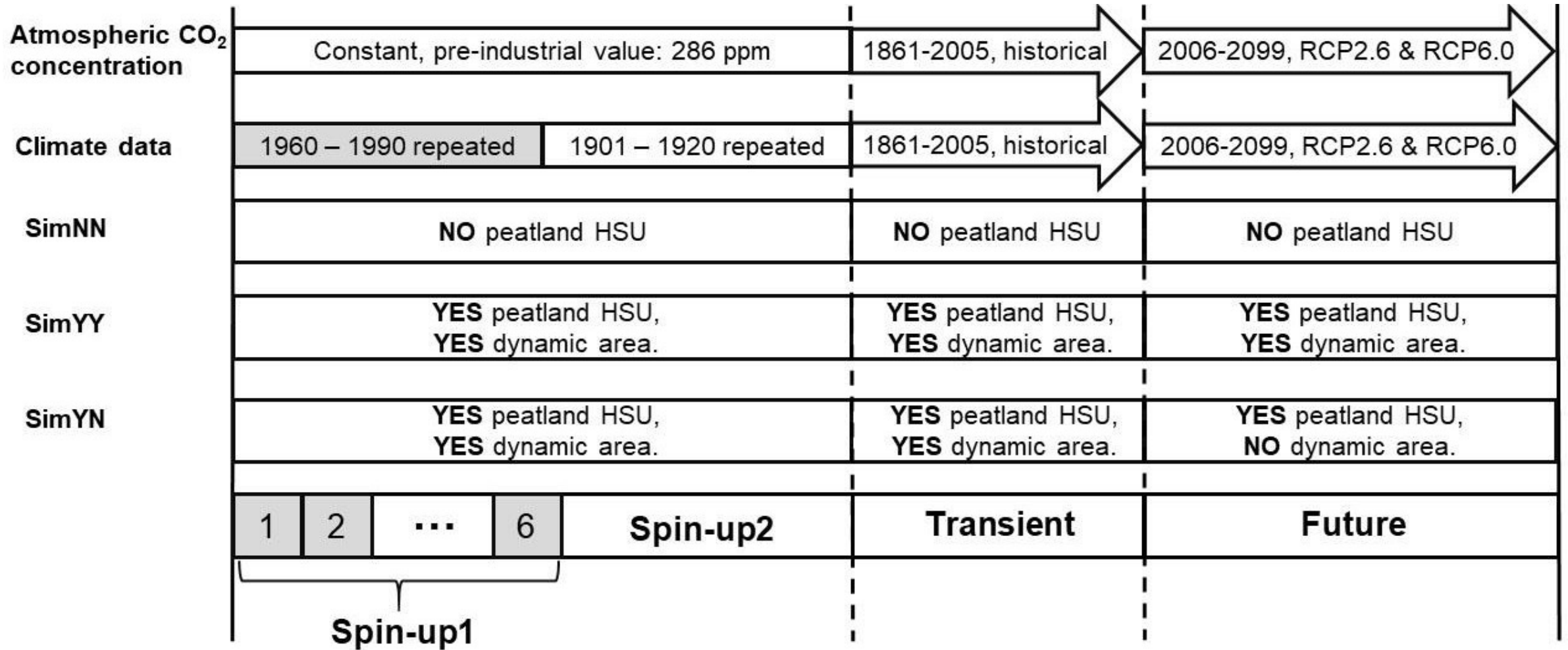
Having the peat in the trunk: The role of N?

- Are peat N limited?

- N leaching from other PFTs?

- We should remove BNF from peat?

- Do we consider cultivated peat?

Having the peat in the trunk?

How do we proceed ?

A wiki page to add the summary of the meeting and the slides