$$\frac{dx(t)}{dt} = \dot{x(t)} = I(t) \cdot b + x(t) \cdot re(t) \cdot A$$

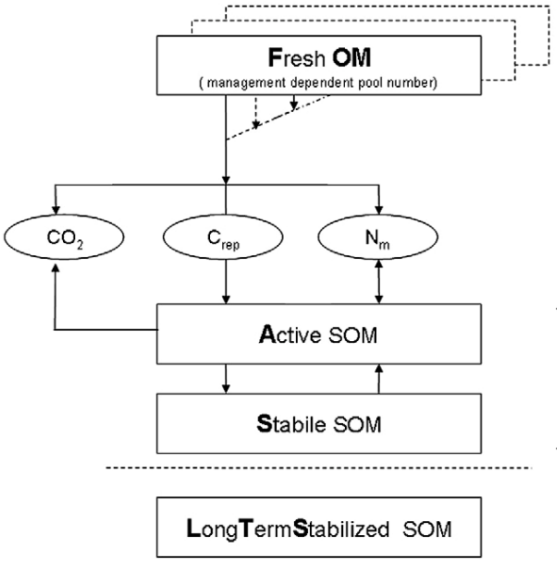
Name

CCB

Important publication

Franko et al., 2011;

Franko and Merbach, 2017



pool concept of CCB, from Franko et al., 2011

Special features

- Uses a meta-model for the environmental response
- All FOM has its own decay behaviour
- Has an inert („long-term stablilized“) SOM Pool

Input distribution: b

As each FOM type that is used, is an own pool (no distribution, later amounts of the same type are added to the rest of the previous inputs)

Initialisation: $x(t_0)$

The pool size of the inert pool is derived by pedo-transfer functions. At moment, the functions of Brooks & Corey are implemented. The remaining SOM is distributed between A-SOM and S-SOM as: $A\text{-}SOM_{t0}$: ~25%, $S\text{-}SOM_{t0}$: ~75%

Environmental response: re(t)

Meta-Model derived from CANDY ((Franko, 1997)

$r\_env = p1 + p2 \cdot T(t) + p3 \cdot P(t)$

with

T(t) = annual mean air Temperature [°C]

P(t) = annual sum of Precipitation [mm] (trimmed to be between 450 and 700 mm)

p1,p2,p3 depend on Clay & Silt

Mass Flow Matrix: A

Flow rates are in [a^{-1}]. Rows are flows into each pool; columns are flows from each pool.

	CO_2	FOM*	C_a	C_s	C_{lts}
CO_2			2.0294		
FOM*		**-k(i)**			
C_a		k(i)*hum(i)	**-2.3579**	0.1168	0**
C_s			0.3285	**-0.1168**	
C_{lts}			0**		**-0****

* Theoretically each FOM has its own k und hum-value.

** a non-linear relation, based on changes of the soil physics, is not implemented in the ensemble version

References

Franko, U., 1997. Modellierung des umsatzes der organischen bodensubstanz. Arch. Agron. Soil Sci. 41, 527–547. https://doi.org/10.1080/03650349709366019

Franko, U., Kolbe, H., Thiel, E., Ließ, E., 2011. Multi-site validation of a soil organic matter model for arable fields based on generally available input data. Geoderma 166, 119–134. https://doi.org/10.1016/j.geoderma.2011.07.019

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