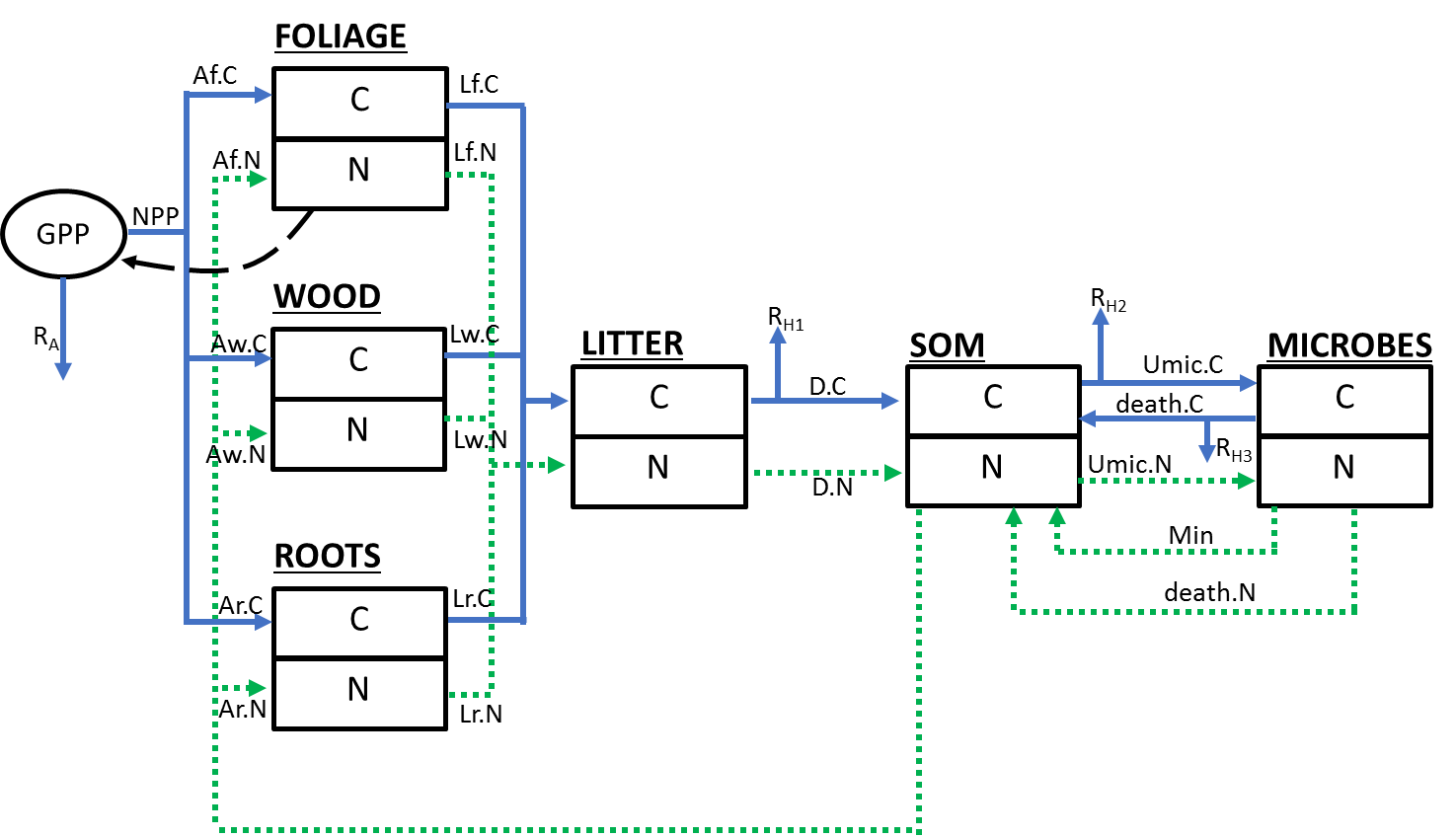
Box Diagram (nitrogen in dashed green, carbon in blue solid):



* Assuming closed N cycle because of the extreme N limitation in the Arctic
* Assuming steady state for each pool

Forcing Variables:

1. PAR (mol) – used to calculate GPP using PLIRTLE model
2. Temperature (°C) – used to calculate GPP using PLIRTLE model

Pools:

1. C.f and N.f– plant foliage C and N (g C m-2 and g N m-2)
2. C.r and N.r– plant root C and N (g C m-2 and g N m-2)
3. C.lit and N.lit – litter C and N (g C m-2 and g N m-2)
4. C.som and N.som – SOM C and N (g C m-2 and g N m-2)
5. C.mic and N.mic – Microbe C and N (g C m-2 and g N m-2)

Process equations:

1. units: g C m-2 day-1 (Shaver et al. 2013)
2. units: g C m-2 day-1
3. units: g C m-2 day-1
4. units: g C m-2 day-1

Fluxes:

1. Af.C = Assimilation of carbon to foliage

units: g C m-2 day-1

1. Aw.C = Assimilation of carbon to wood

units: g C m-2 day-1

1. Ar.C = Assimilation of carbon to roots

units: g C m-2 day-1

1. Af.N= Assimilation of carbon to foliage

units: g N m-2 day-1

1. Aw.N= Assimilation of carbon to wood

units: g N m-2 day-1

1. Ar.N= Assimilation of carbon to roots

units: g N m-2 day-1

1. Lf.C – Litterfall of foliage carbon

units: g C m-2 day-1

1. Lf.C – Litterfall of foliage nitrogen

units: g N m-2 day-1

1. Lw.C – Litterfall of wood carbon

units: g C m-2 day-1

1. Lw.N – Litterfall of wood nitrogen

units: g N m-2 day-1

1. Lr.C – Litterfall of root carbon

units: g C m-2 day-1

1. Lr.N – Litterfall of root nitrogen

units: g N m-2 day-1

1. D.N – Decomposition of nitrogen from litter

units: g N m-2 day-1

1. D.C – Decomposition of carbon from litter

units: g C m-2 day-1

1. Umic.C – Microbial uptake of carbon

units: g C m-2 day-1

1. Umic.N – Microbial uptake of nitrogen

units: g N m-2 day-1

1. death.C – Carbon from death of microbes

units: g C m-2 day-1

1. death.N – Nitrogen from death of microbes

units: g N m-2 day-1

1. Min – Mineralization

units: g N m-2 day-1

1. Rh1 – Heterotrophic respiration flux 1 (from decomposition of litter)

units: g C m-2 day-1

1. Rh2 – Heterotrophic respiration flux 2 (from microbial uptake of C)

units: g C m-2 day-1

1. Rh3 – Heterotrophic respiration flux 3 (from microbial death)

units: g C m-2 day-1

Differential Equations: