

FLUXNET 'DISTURBANCE parallel session'

Paper outline

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Introduction

Odum's principle : maximisation of energy ; Marghalev's disturbance
Bev Law for forests with disturbance, but not with other systems

Categorise disturbances:

- C removal (harvests, clear cuts)
- Canopy thinning or defoliation: additional respiration
- Severe disturbance (fire, ploughing): chemical oxidation and additional respiration, plus 'full' defoliation

Obviously many biogenic disturbance (insects, herbivory...) which mostly lead to defoliation

Objectives

Understand C losses caused: **Option 1 by all the disturbance types, Option 2 by harvests**

Compare forest, grassland and cropland systems

Investigate and generalise models

Test whether the net C storage is a rather constant fraction of the max NEE in very different systems.

Make recommendations for the management of ecosystems as C accumulators

M&M

FluxNet

Results

- Figure 1

Harvest

A, forest; B, grassland; C, cropland

Y: NEE, X, time from harvest

Message: different timescales, but similar patterns

Temperature or climate dependency of recovery after harvest

Same, for GPP (D,E,F) and Reco (G,H,I)

- Figure 2 Standardised carbon fluxes after harvest

Same as above, but:

X axis standardised to 1, for the rotation period

Y axis standardised by post and before disturbance

- Table 1. Fit of curve (maybe log log scale): drop after harvest, duration of recovery, max. rate of recovery, inflexion point...

- or 3PJ model to disturbance events (dynamic model), emerging property fraction allocated to the ground.

Landsberg & Waring 1997. Forest Ecol Managt
Andren & Katterer ICBM, Ecol Applications

Figure 2 (bar graph). Elaborate from Table 1, the max. of processes, the average over the rotation and the C which is left. This could be across the system.

Figure 3. Plot Reco vs. GPP shows what fraction has been respired.

In Option 1, add more results concerning:

- Canopy thinning (thinning for forests, grazing)
 - o Let in more radiation and more diffuse, change LAI. Connect with Alessandro about this.
 - o
- Severe disturbance (ploughing, fire...)

Discussion