

seventh  
**NORTH AMERICAN  
FOREST ECOLOGY  
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UTAH STATE UNIVERSITY  
Logan, Utah USA

# Influence of coarse woody material (CWM) on soil microarthropods in black spruce-feather moss forests of Western Québec

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# INTRODUCTION

- In boreal forests, downed CWM is both a conservation and a forest productivity issue. How is linked CWM decomposition with soil organisms?
- In the black-spruce clay-belt region of Western Québec soil nutrients are limited by paludification and *Sphagnum* growth
- Does the CWM affect forest floor microarthropods in this environment?



# INTRODUCTION



**ORGANIC SOIL**

**Marra & Edmonds, 1998**

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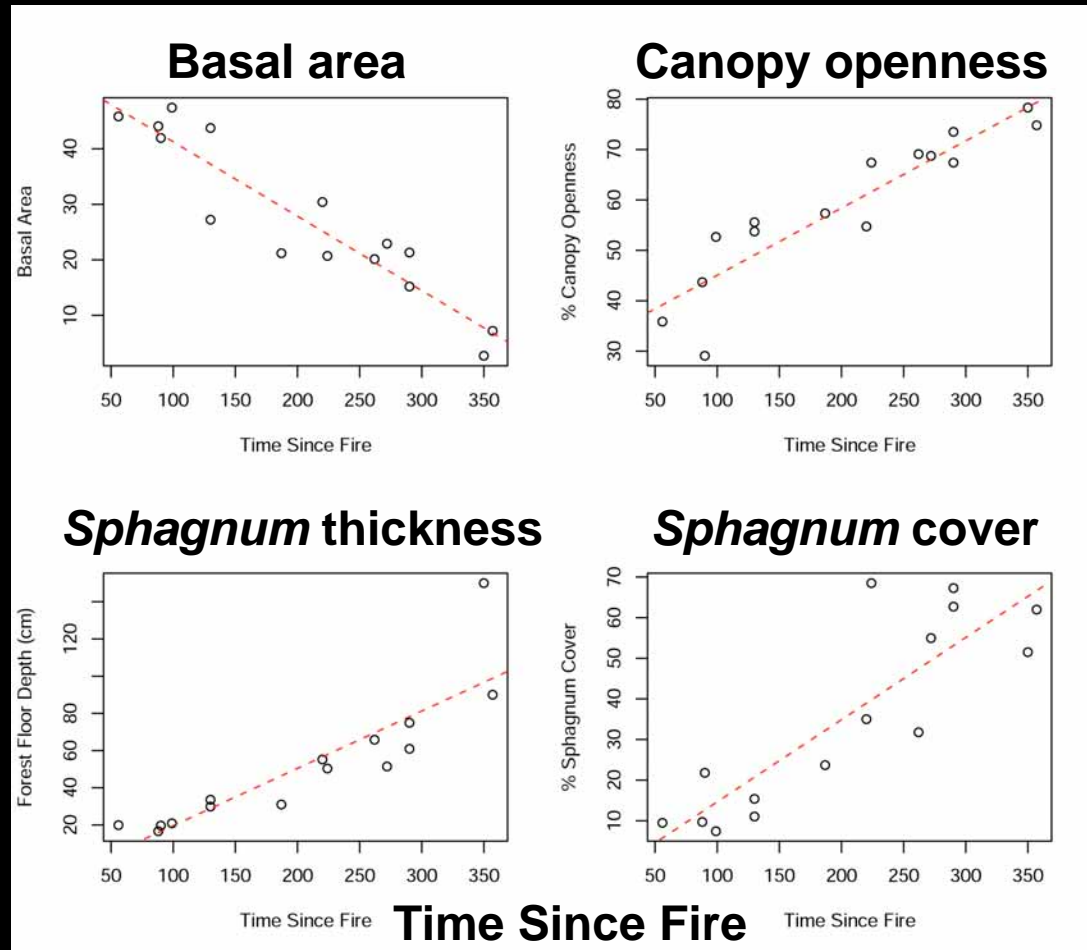
# INTRODUCTION

- Paludification

Moss cover gets thick

Water table rises

Forest floor is acidic and cold



Fenton et al., 2004

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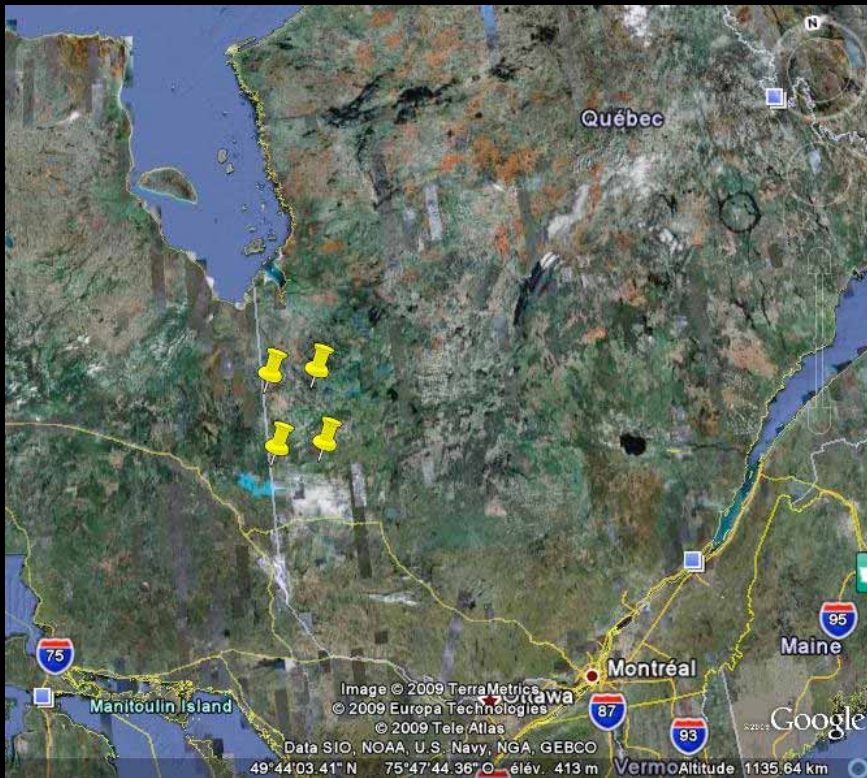
**BRYOPHYTE**

**ORGANIC SOIL**



# METHODS

- Study site

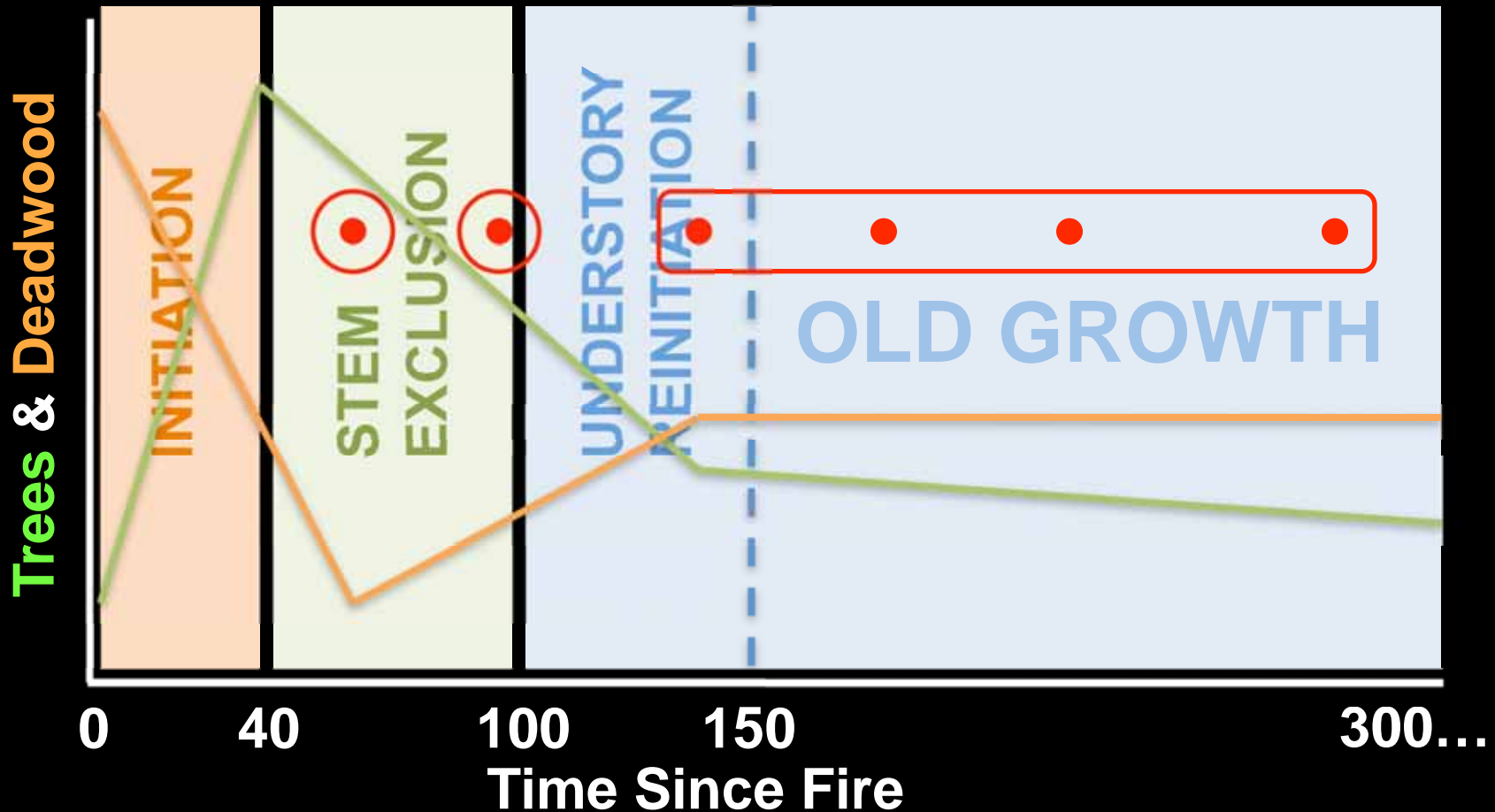




# METHODS

- Black spruce forest development

Oliver 1981  
Harper et al. 2005



# METHODS

- Sampling design



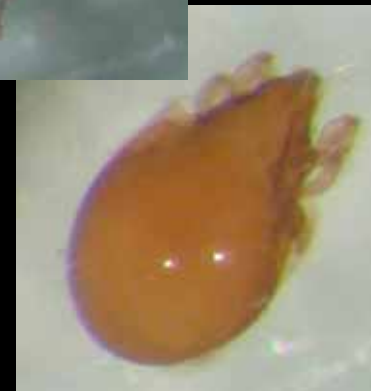
# RESULTS

- **Microarthropod community**

292 springtails



44 oribatid species

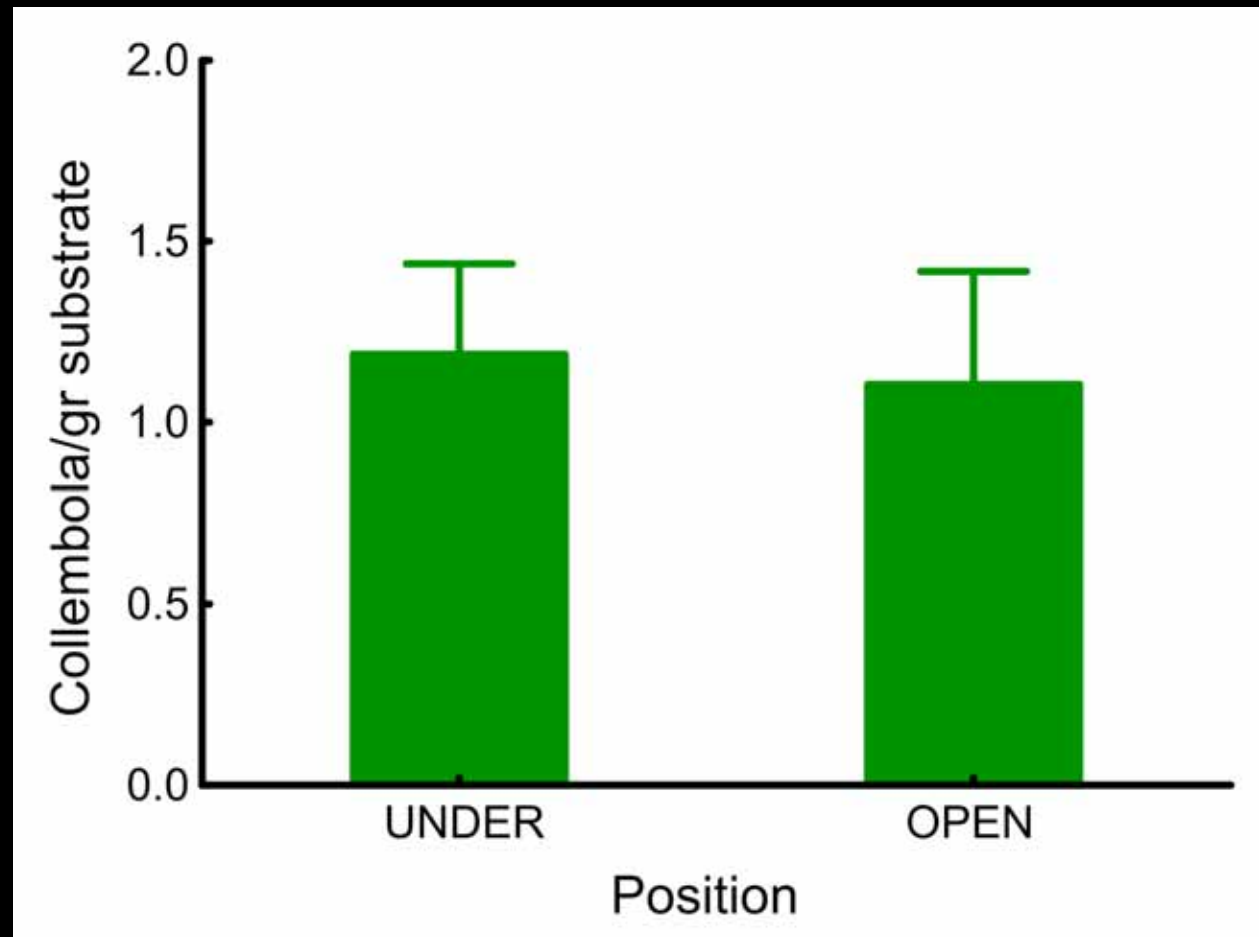


1062 mites (826 Oribatida)



# RESULTS

- Influence of CWM



# RESULTS

- Position and species assemblage

OPEN

UNDER

40 species



34 species

Sorensen index = 0.811

Morisita-Horn index = 0.792

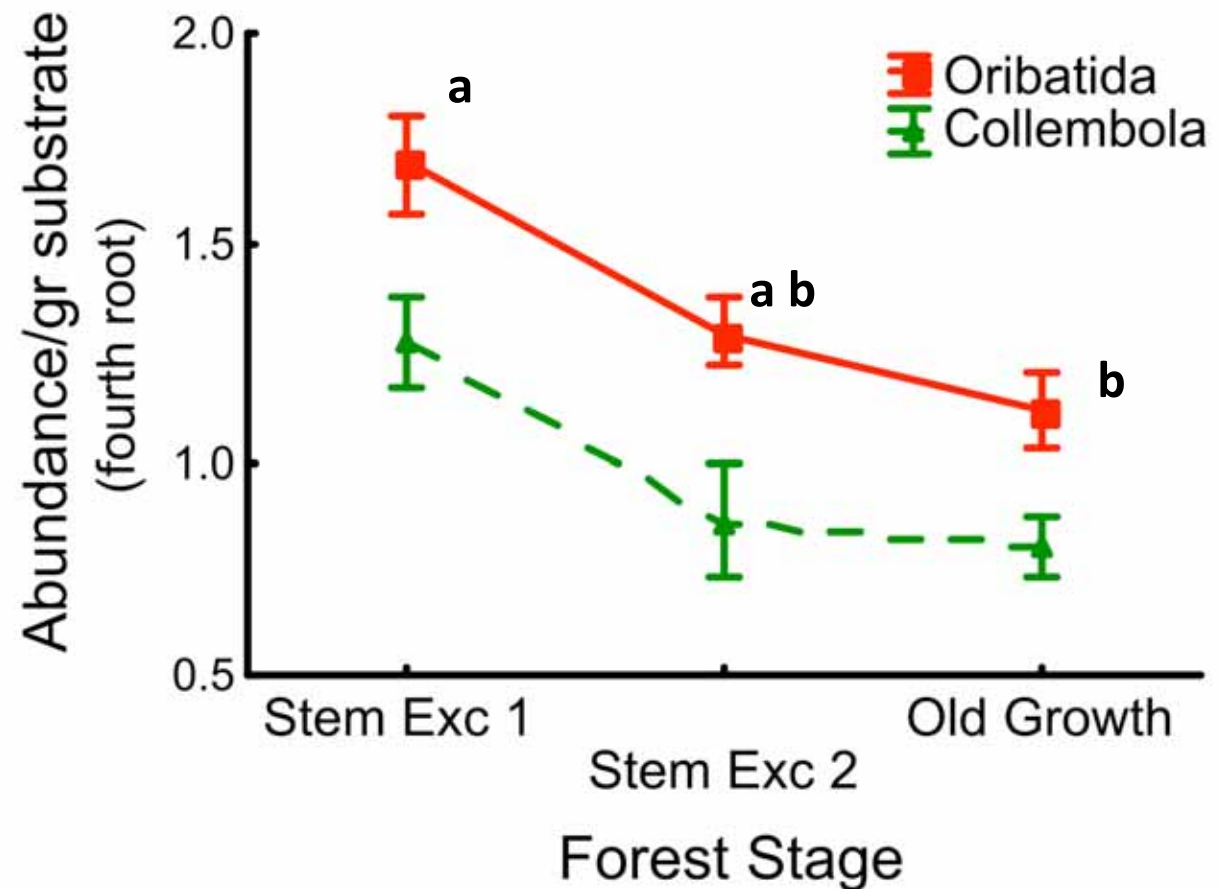
Shared species = 30



# RESULTS

- Forest development

$F = 3.79, P < 0.05, d.f. = 2, 36$





# RESULTS

- Forest stage and species assemblage



Sorensen index =

0.745 0.645 0.761

Morisita-Horn index =

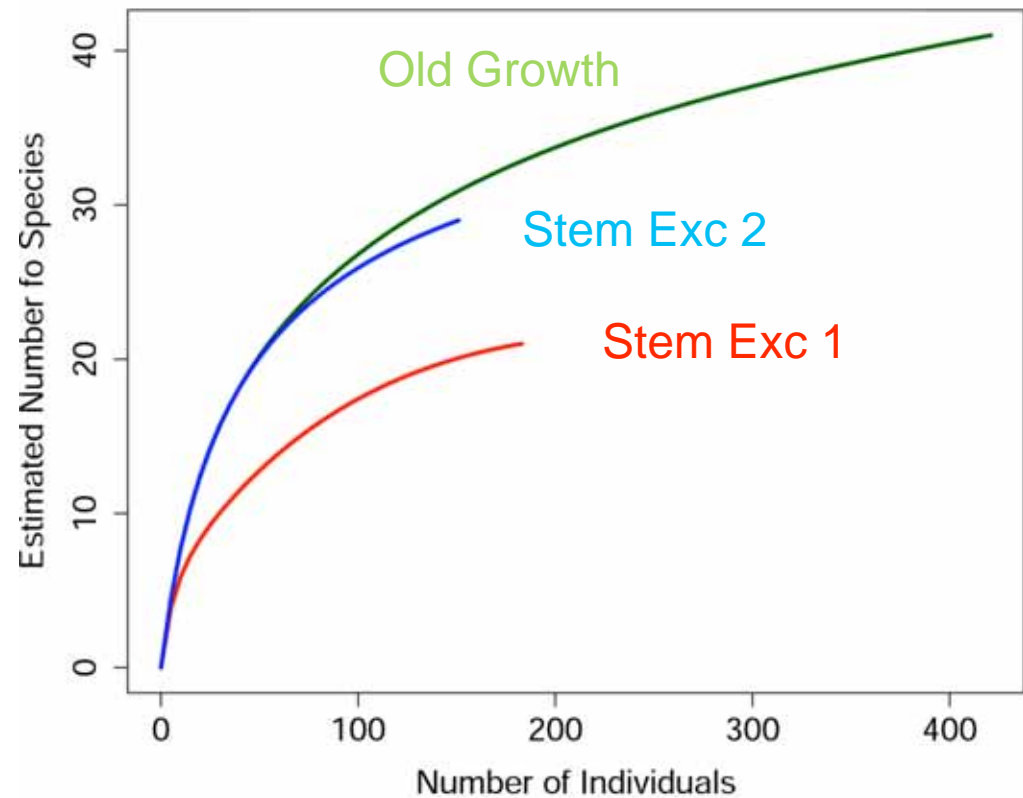
0.492 0.726 0.667



# RESULTS

- Forest stage and species assemblage

	Hulbert Diversity Index	
Stem Exc 1	0.85	<sup>a</sup>
Stem Exc 2	0.92	<sup>b</sup>
Old Growth	0.90	<sup>ab</sup>



# DISCUSSION

- The impeded litter fall hypothesis

**LEAF LITTER**

**BRYOPHYTE**

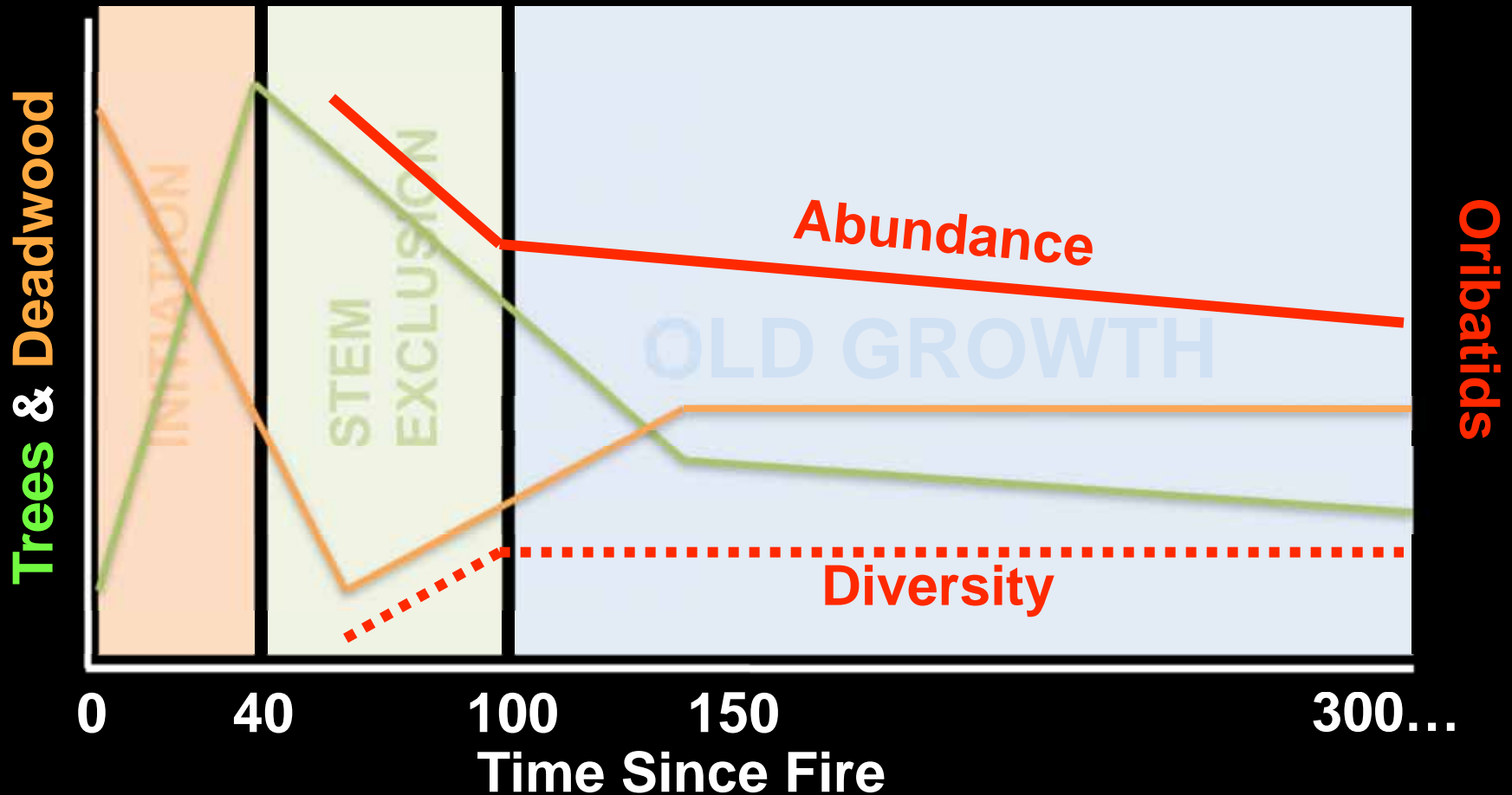
**ORGANIC SOIL**





# DISCUSSION

- Forest development



# TAKE HOME MESSAGES

In black spruce-feather moss forests:

- CWM do affect oribatid mite communities (but contrary to our initial expectations)
- Lower density and diversity of oribatids under logs than in adjacent open spaces suggest a preference for recent litter supply
- Oribatid abundance decrease temporally following tree thinning
- Oribatid similarity is consistent between positions and forest stages

GRACIAS!!

