

# Atmospheric $^{14}\text{C}$ , Root $^{14}\text{C}$ , Root Modeling

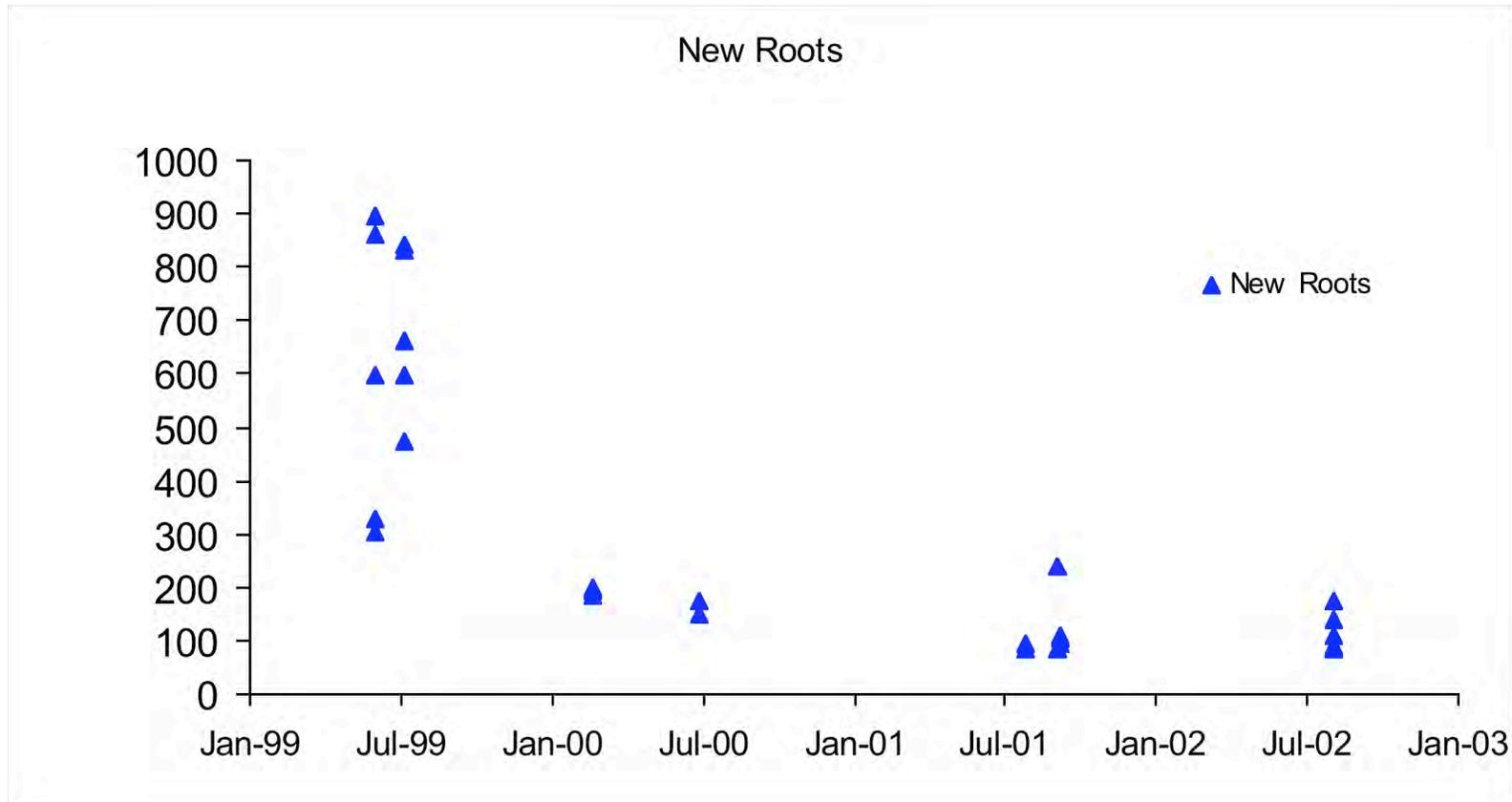
Julia B. Gaudinski, Margaret Torn, Bill Riley, Dev Joslin

EBIS WORKSHOP  
LLNL  
January 20, 2005

## Outline

- 1) Atmospheric  $^{14}\text{C}$  Curve
- 2) Root Data, Submitted MS highlight data and conclusions
- 3) Storage Results

# 1. Atmospheric record for our model



**Tree rings alone will not work for modeling root values**  
**Have to come up with atmosphere using proxies**

## Proxies

	East		West	
	1999	2000	1999	2000
Tree rings (3 y <sup>-1</sup> ) (EBIS sites)	×	*	*	*
Tree rings (3 y <sup>-1</sup> ) (non-EBIS sites)	×	×	×	×
Leaves (non-EBIS sites)	×	×		*
Soil respiration and soil gas	*	×		

× = Data exist but we will not use them in the proxy record.

\* = We will use the data in the proxy record.

Leaves-West ORR

Avg = 2111

Std = 1811

SE = 573

Calculate atmosphere in 1999 and early 2000 using soil respiration data (EAST ORR) and on west side use east side timing and leaf data.

After 2000.3 we use only the tree ring data as a direct atmospheric  $\Delta^{14}\text{C}$  estimate on both sides

Calculate EAST ORR atmospheric  $\Delta^{14}\text{C}$  in 1999 and early 2000 using

$$F_m = F_h + F_a$$

$$(F_h + F_a)\Delta_m = \Delta_h F_h + \Delta_a F_a$$

$$\Delta_a = (1 + f)\Delta_m - f\Delta_h$$

F = Flux in  $\text{g C m}^{-2} \text{y}^{-1}$

m = measured soil-surface source

h = Heterotrophic source

a = Autotrophic source

$\Delta$  =  $\Delta^{14}\text{C}$  signature

Assumes  $F_a$  is from recently fixed C and is representative of instantaneous atmospheric  $\Delta^{14}\text{C}$  values—or lag??

$F_a$  comes from older SOM and equals xxx ‰

Will be redone!

