Synthesis and Integration of Studies of Secondary Forests

1. How fast does biomass accumulate and what factors are important as controllers of regrowth rates?

2. What can be detected from remote sensing platforms with respect to successional stage, biomass, cover area, and persistence of secondary forests? How do these attributes vary across the basin?

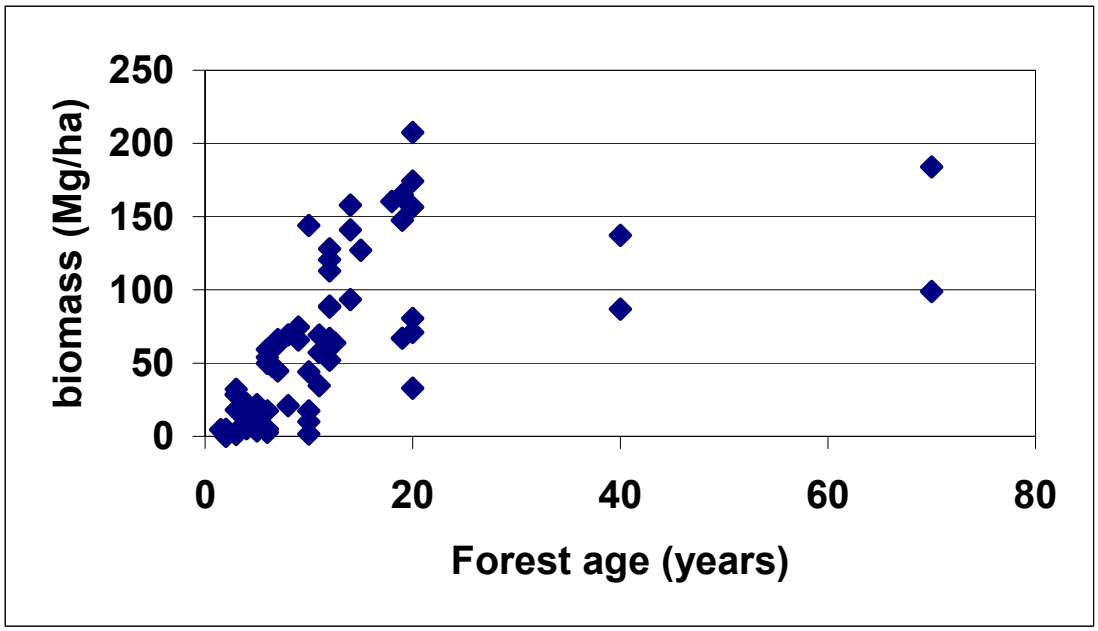
Biomass synthesis product

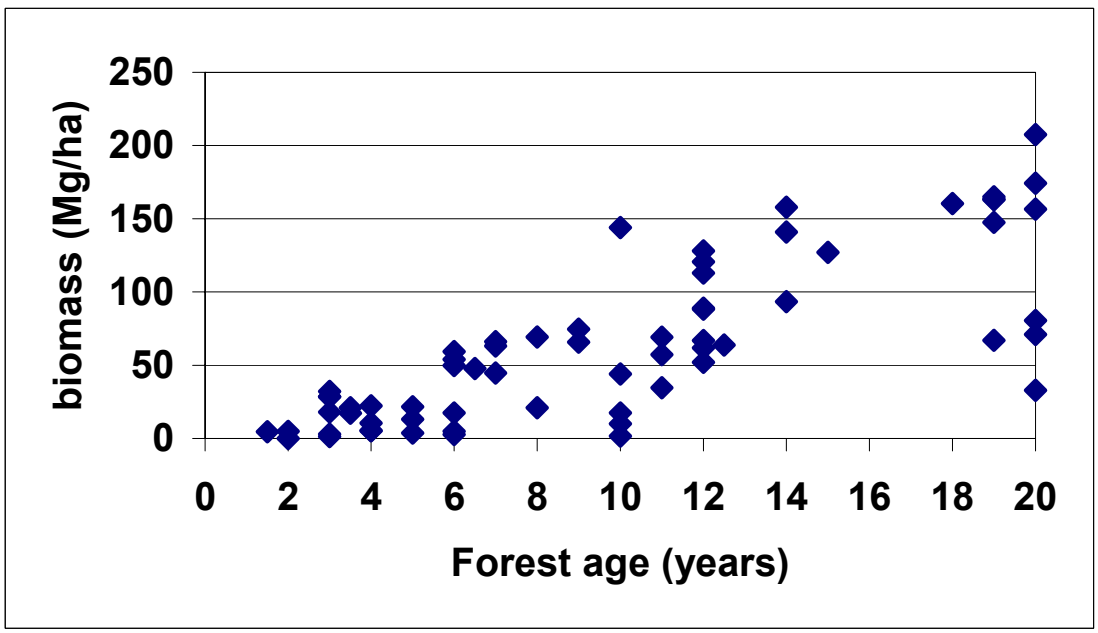
1. Use new data to validate old models

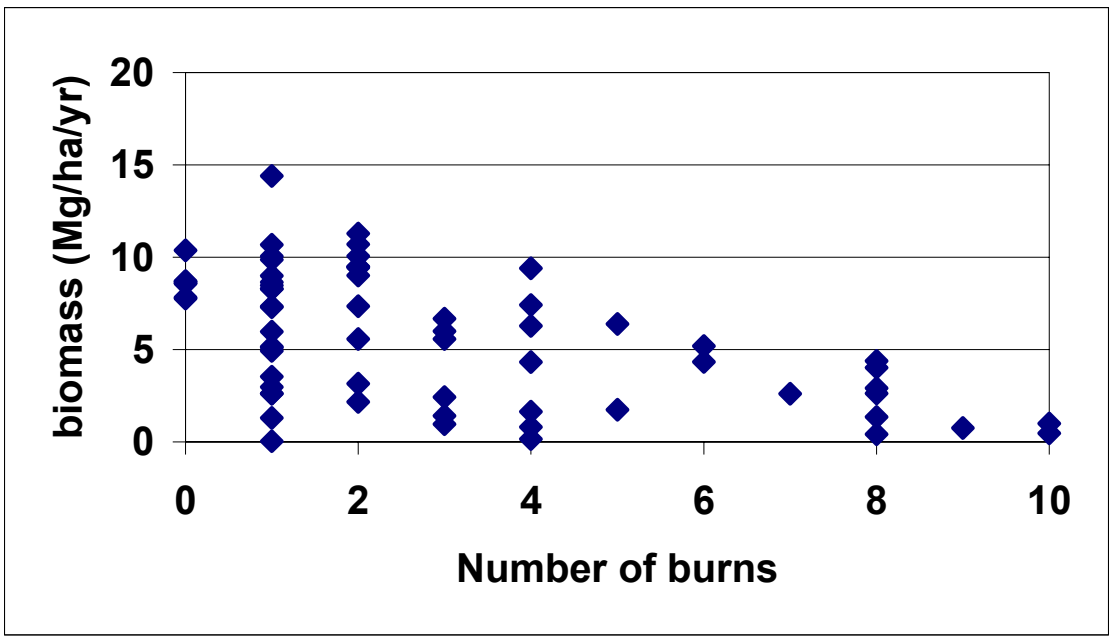
2. Use new data to improve old models (e.g., include number of burns as an input variable)

3. Analyze error terms, such as inconsistencies in allometries, size classes, definitions of time of old field or pasture abandonment

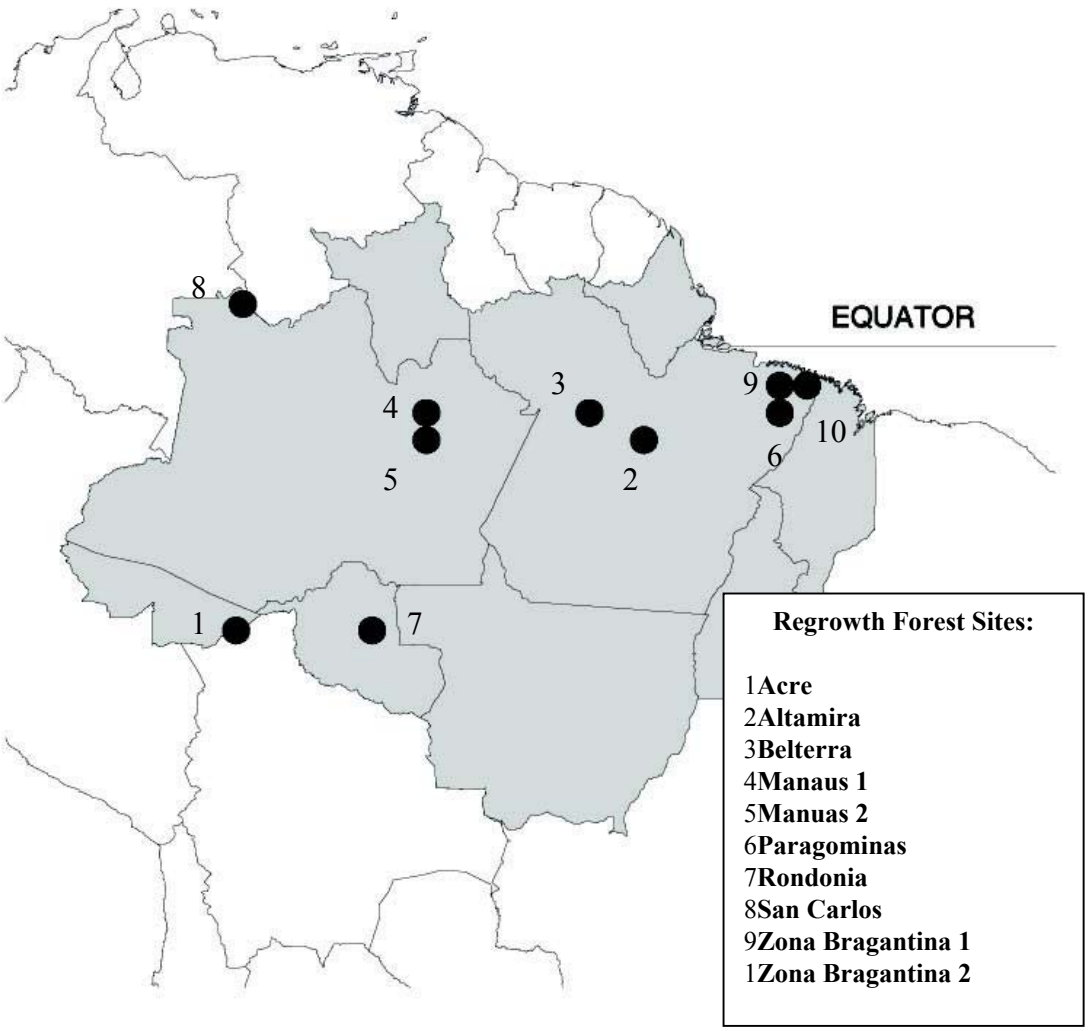
4. Compile list of species-specific allometric equations and some analysis of their attributes.


biomass (Mg/ha)
250
200
150
100
50
0
0
20
40
60
80
Forest age (years)


biomass (Mg/ha)
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Forest age (years)


biomass (Mg/ha/yr)
20
15
10
5
0
0
2
4
6
8
10
Number of burns

CARBON ACCUMULATION RATES IN AMAZONIAN REGROWTH FORESTS:
Model Analysis, Refinement and Convergence



Zarin Hurtt & Salas, in prep

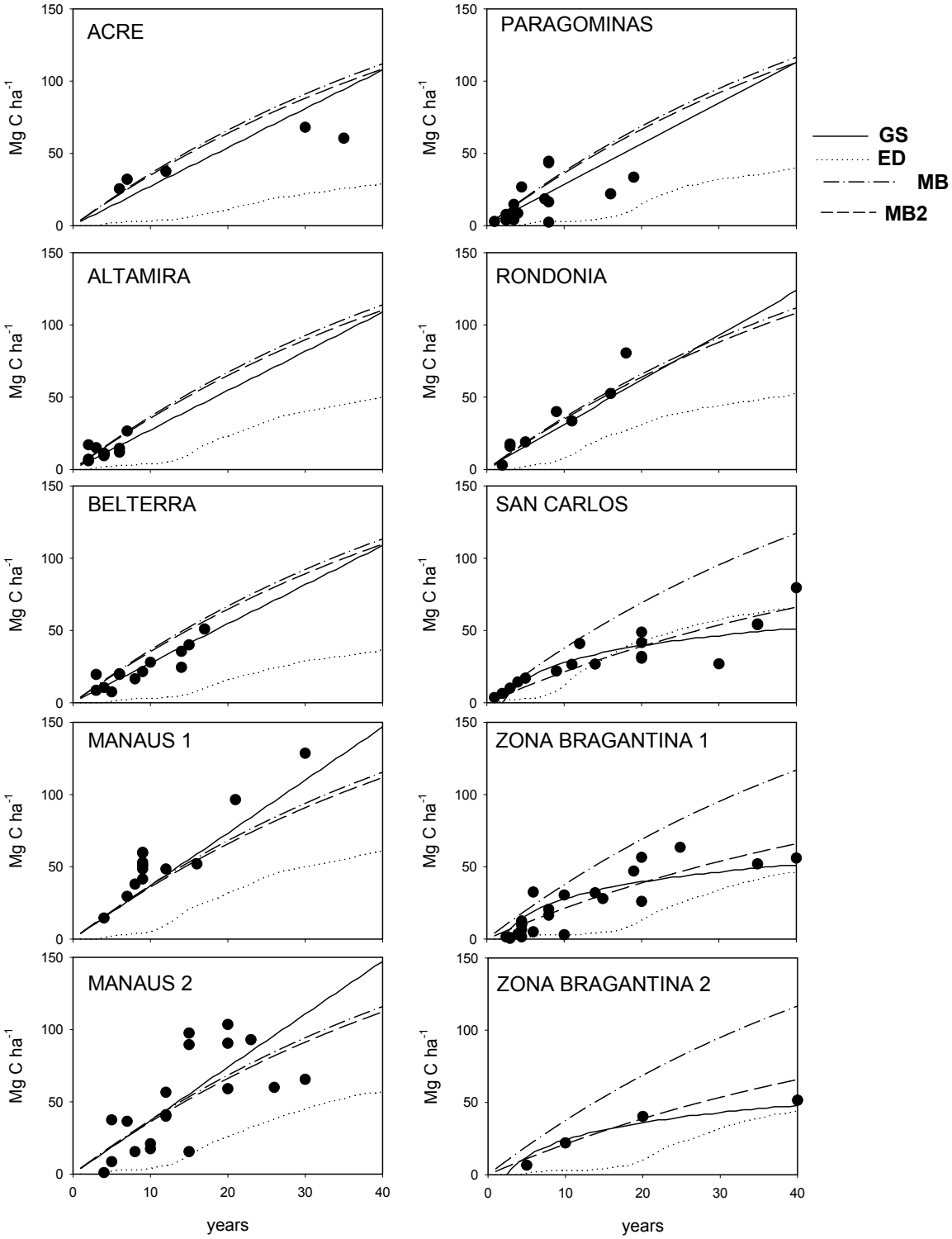


Figure 1: Data and models shown at LBA meeting in San Francisco (December 2002) with Miami-based models updated to reflect revision by Schuur (2002). GS=growing season model (Zarin et al. 2001); MB=Miami biomass model (Schuur 2002, Hurtt et al. 2002); MB2=Revision of MB that accounts for soil texture differences (sandy v. non-sandy); ED=Ecosystem Demography Model (Moorcroft et al. 2001).

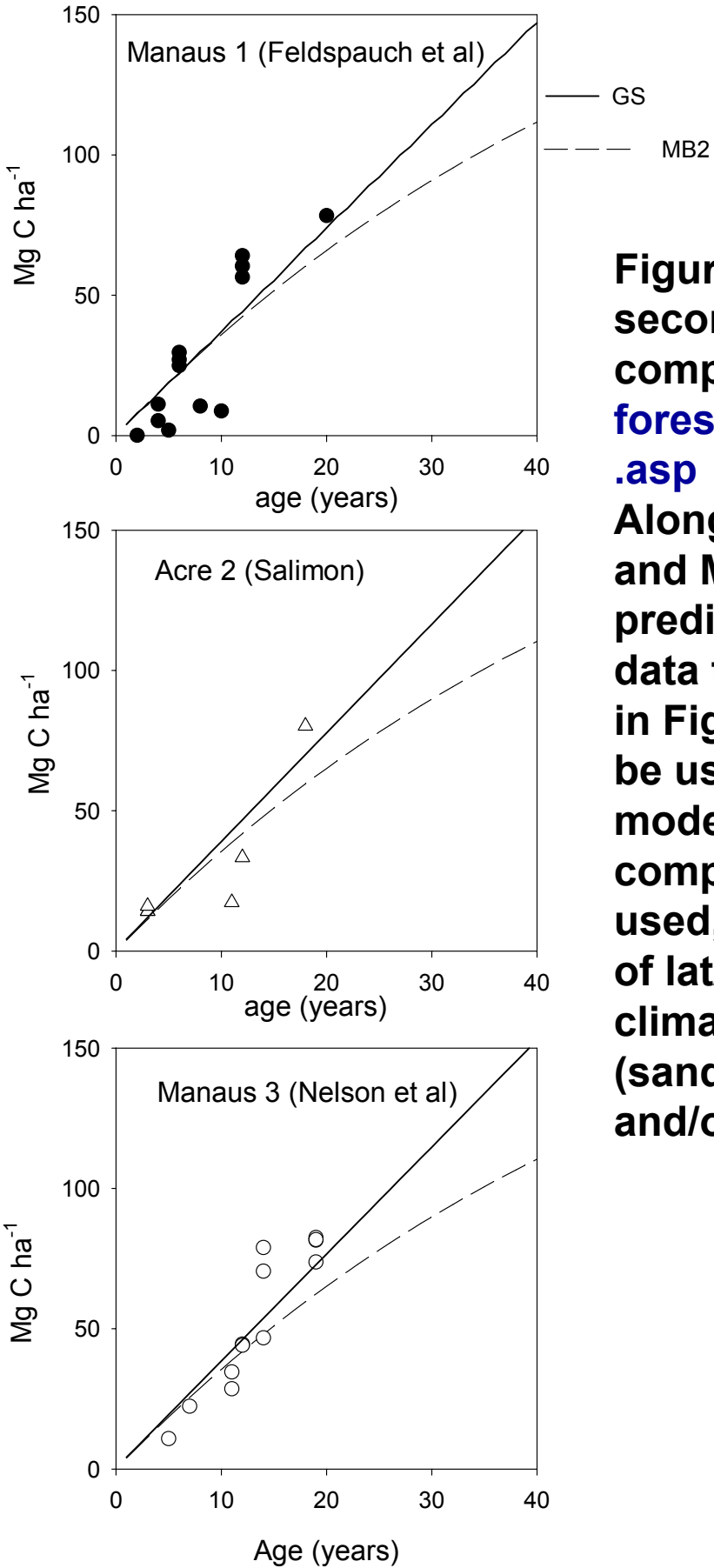
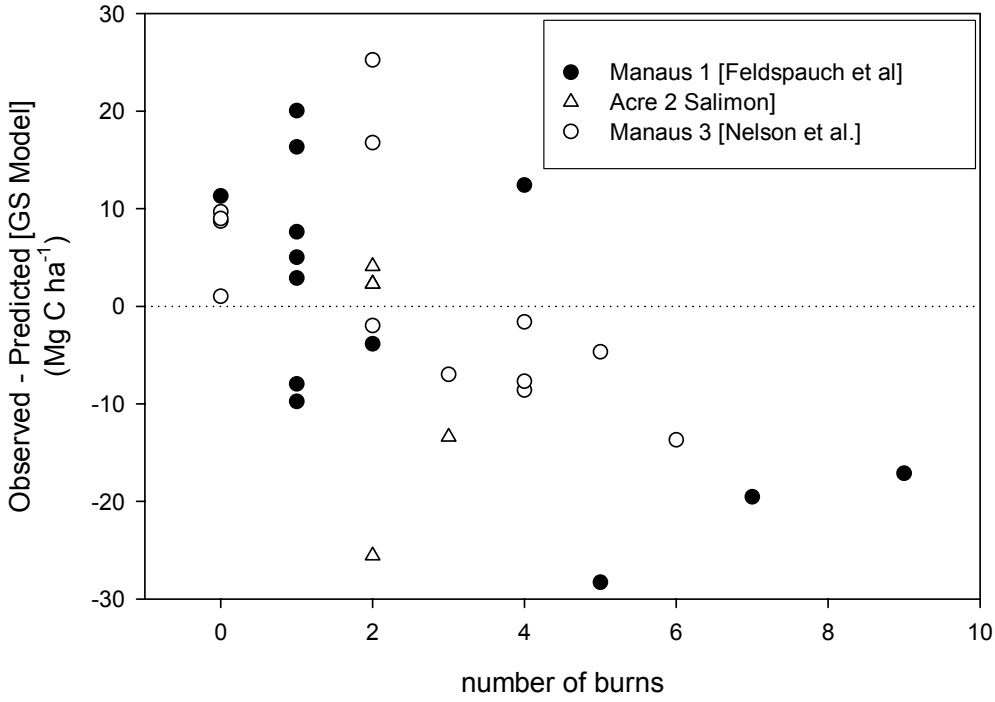


Figure 2: Data from LBA secondary forest data set compiled at www.tropicalforests.ufl.edu/lba/aboutdb.asp
Along with associated GS and MB2 model predictions. These are data that are not included in Figure 1 and hence may be used to "validate" the models. Other sites in the compilation will also be used, pending verification of lat/long and associated climate data, soil texture (sandy v. non-sandy), and/or other issues.



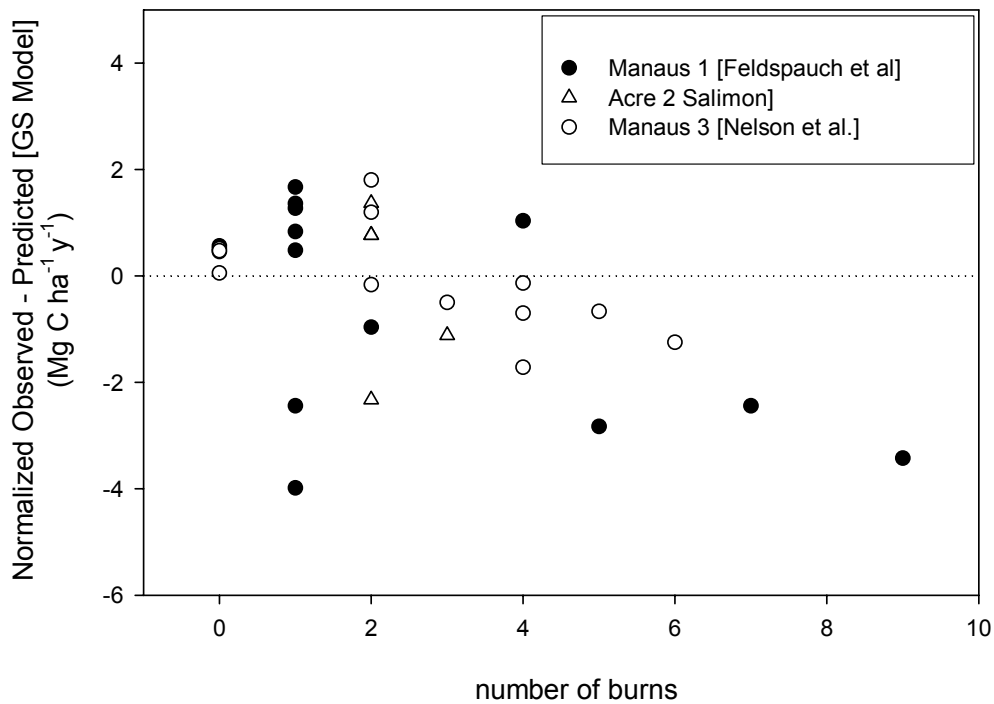
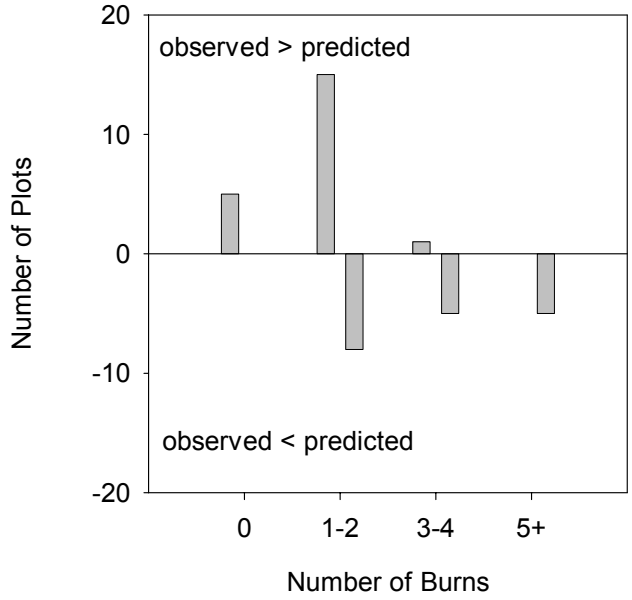
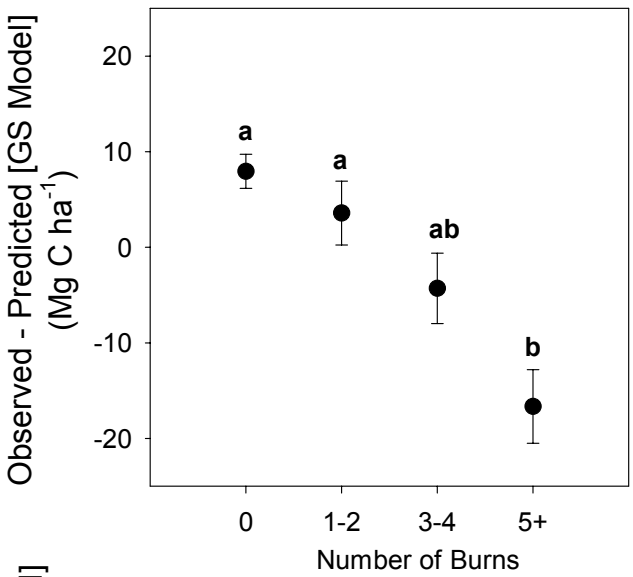


Figure 3: The difference between observed and predicted values (GS model) for sites illustrated in figure 2, in relation to the number of times an individual plot has been burned. The top panel illustrates the difference in absolute terms; the bottom panel is the same data divided by age for each individual plot to account for the artifact of larger absolute deviations appearing as age and biomass increase.





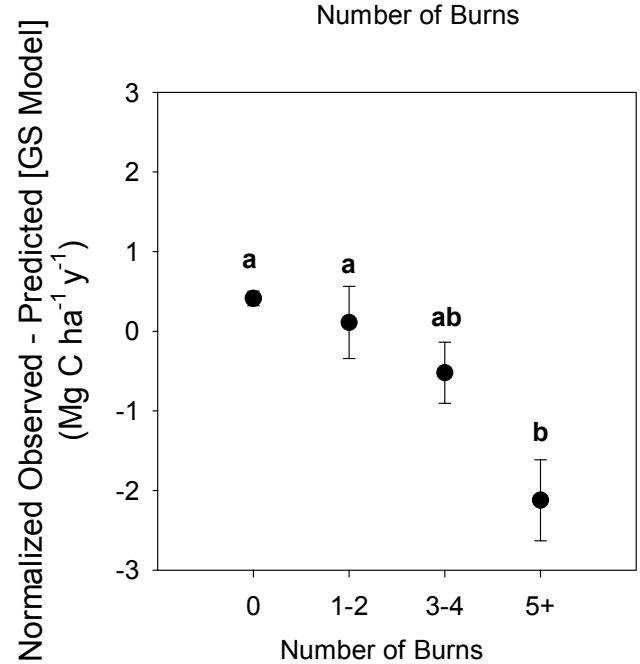


Figure 4: Top panel – frequency of positive and negative differences illustrated in Figure 3; Middle panel - mean±se for absolute differences between observed and predicted values (GS model) within burn frequency classes; Bottom panel - mean±se for annualized differences between observed and predicted values (GS model) within burn frequency classes. Different letters in middle and bottom panels indicate significant differences at P<0.05 (Tukey).

www.tropical forests.ufl.edu/lba/aboutdb.asp

Closing date for new data to be included in this analysis: December 1, 2003 – contact psampaio@ufl.edu if you need help accessing the database).

Questions/Comments contact: Zarin@ufl.edu

Remote sensing synthesis product

1. Survey of remote sensing projects.
2. Compile data from projects.
3. Cross-site comparisons and analyses.
4. Address site-to-basin scaling

Contacts: Dar Roberts or Bill Salas

Second Growth Questionnaire Topics

1) Study Location
2) 2nd Growth Definition Criteria
3) Second Growth Extent (ie, ha)
4) Ratio of SG/Cleared area
5) Persistence Yes/no
    If yes, mean residence time
6) History Yes/no
    If yes, how determined, prior land-cover, etc.
7) Method: How was it mapped
8) RS parameters extracted
    ie, age, successional state, biophysical properties
9) Corresponding field data and supporting data
    ie, GIS, stand data
10) Data used
    ie sensor type, date acquired, Ndates, Range, data gaps etc.

Additional Activities:

Organize a session on synthesis and integration of secondary forest studies at the July 2004 meeting in Brasilia (Batistella, Mesquita, Roberts, Salas, Davidson, Fernandes)

1) **Definition of secondary growth (floristics, remote sensing, land use) Batistella, workshop organized by Walker in early LBA**
2) **Factors affecting biomass accumulation rates (climate, soils, management) Zarin**
3) **Synthesis of remote sensing studies; Roberts, Salas**
4) **Effects of land-use history on successional trajectories (species importance values)**
5) **Compile and analyze species-specific allometric equations**
6) **Future of secondary forests ("degraded lands")**

Define outline of a synthesis book volume