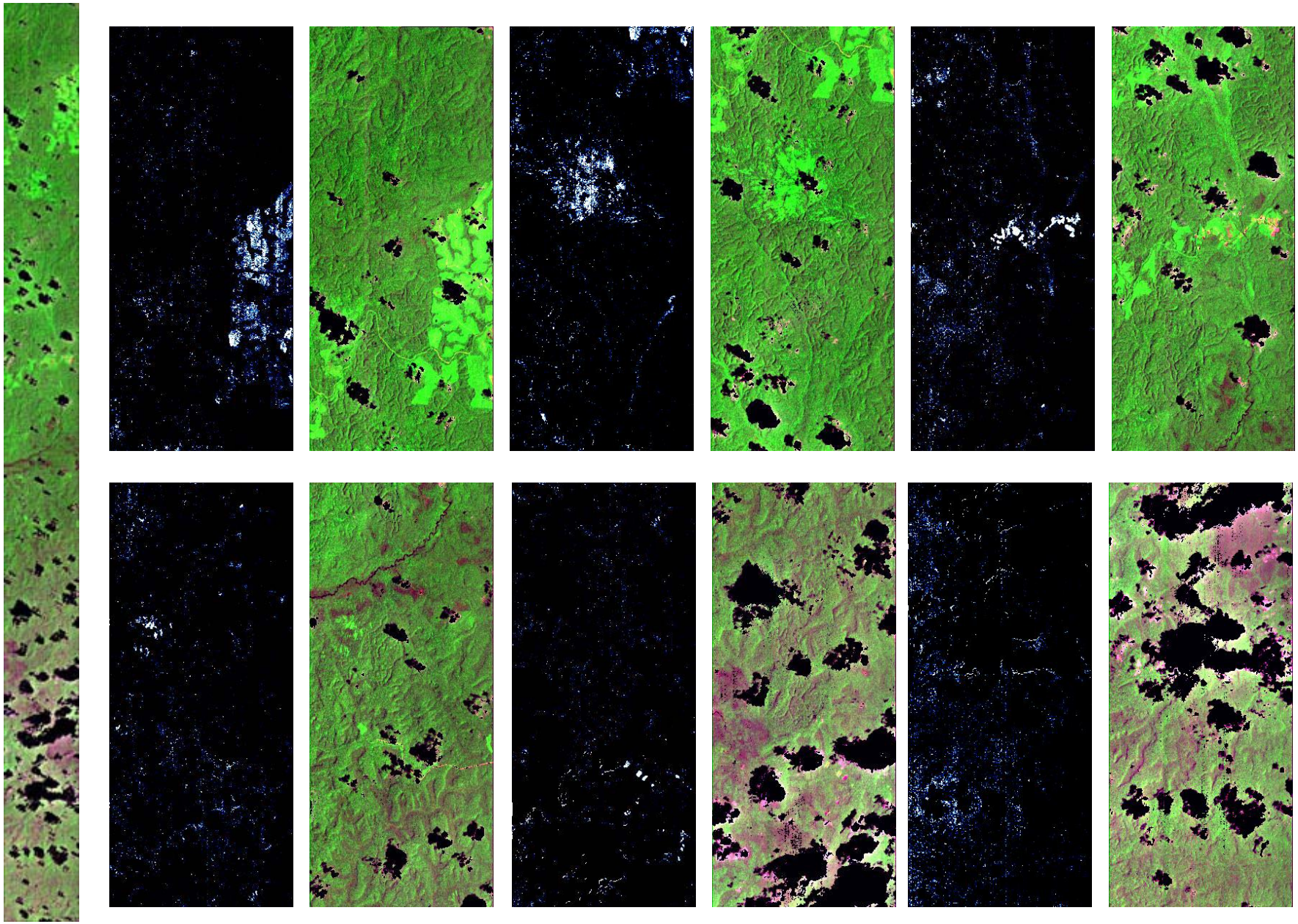
Disturbance Effects on Carbon Dynamics in Amazon Forest: A Synthesis from Individual Trees to Landscapes

- **Workshop 1 – Tulane University, New Orleans, Late June 2004**
  - **(i) developing a consistent basin wide dataset of tree mortality dynamics from inventory plot data**
  - **(ii) exploring different remote sensing methods for detecting intermediate-scale (~0.1 to 5 ha) canopy gaps – e.g. blowdowns, selective logging.**
  - **(iii) comparing modeling approaches of forest response to gap disturbance**

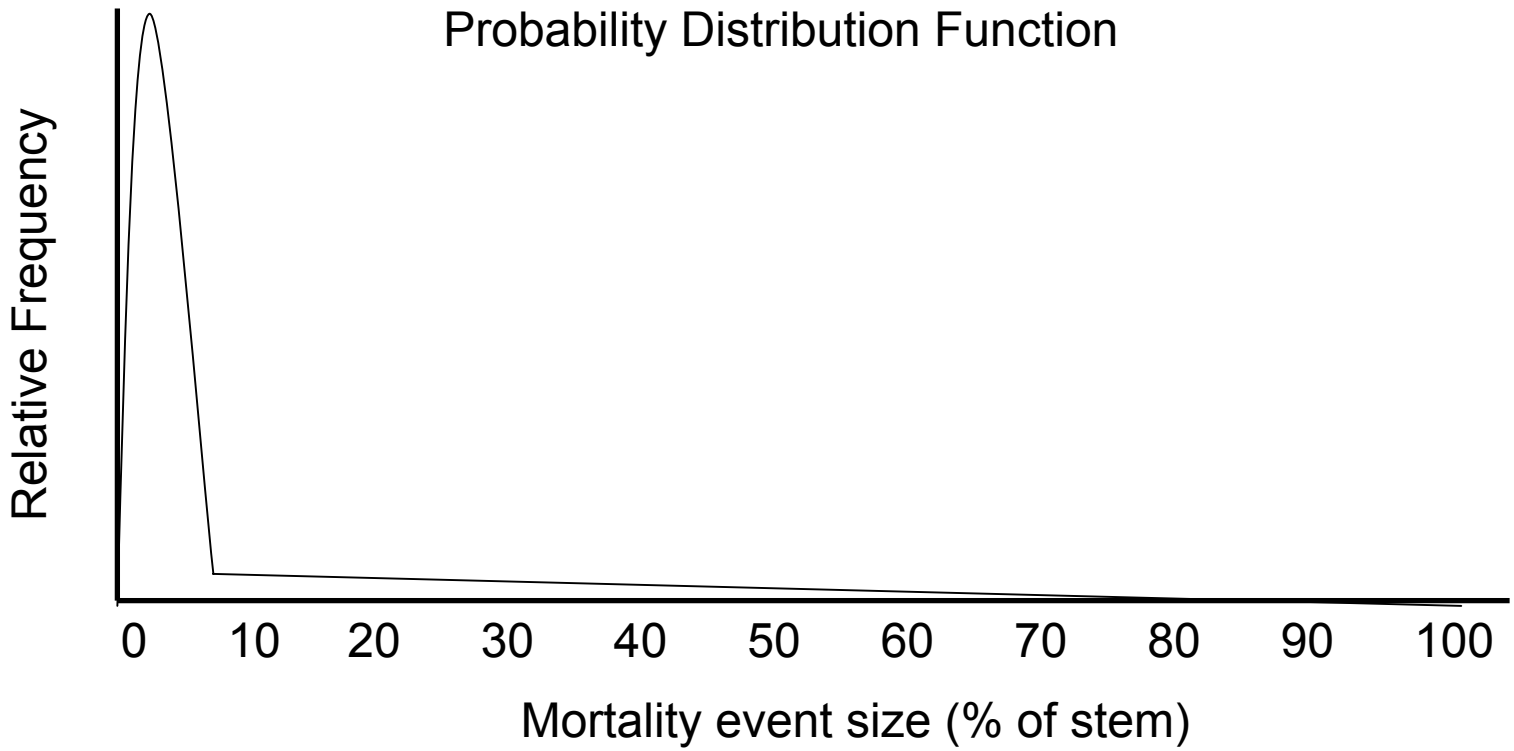
- **Workshop 2 – Tulane University, New Orleans, Late May 2005**
  - **(i) exploring a general forest response framework across the natural to anthropogenic disturbance gradient**
  - **(ii) comparing various remote sensing methods for detecting a range of disturbance types and processes**
  - **(iii) evaluating modeling approaches for simulating this disturbance gradient**

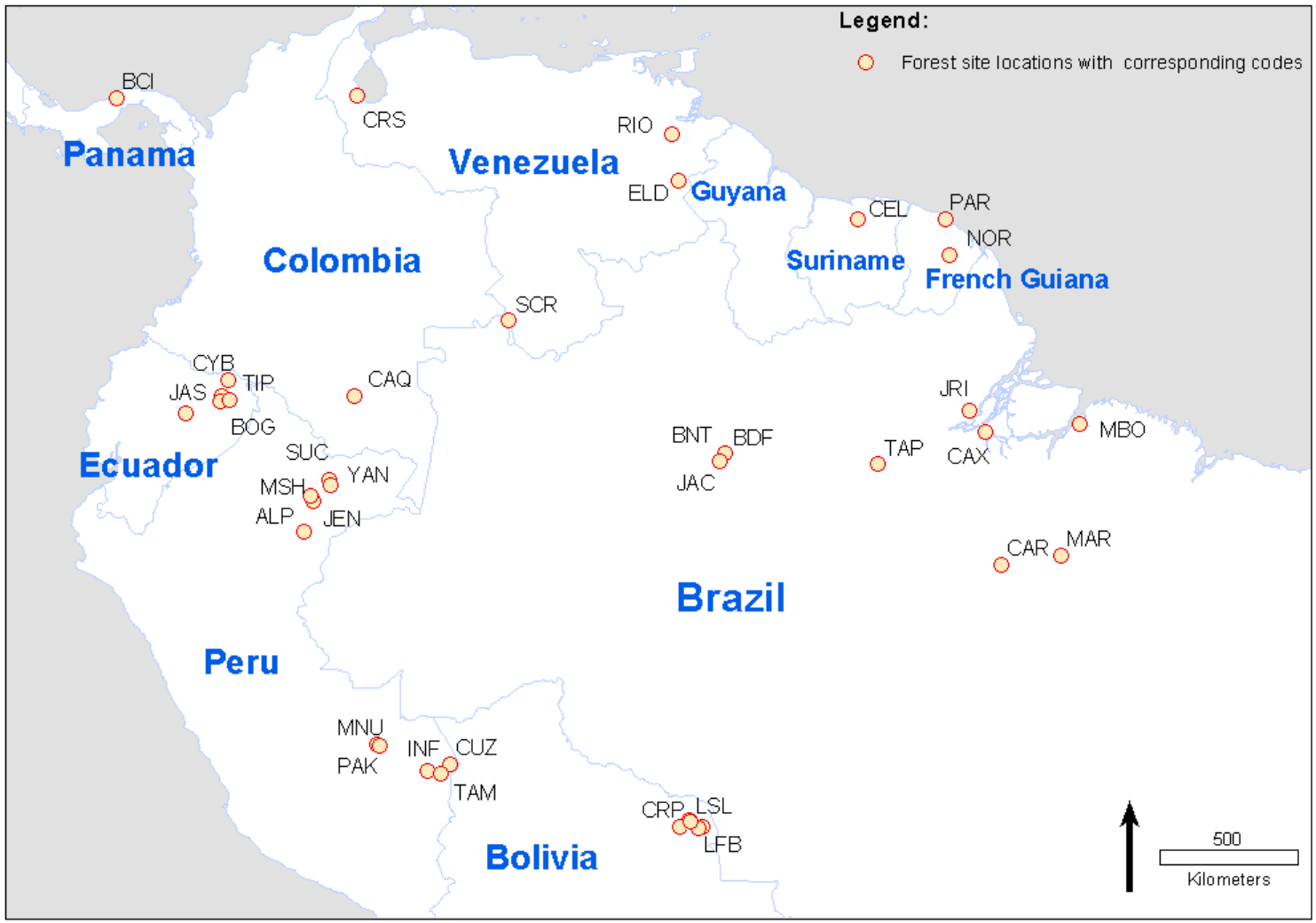
What is the PDF of mortality events from 1 tree to 100%?

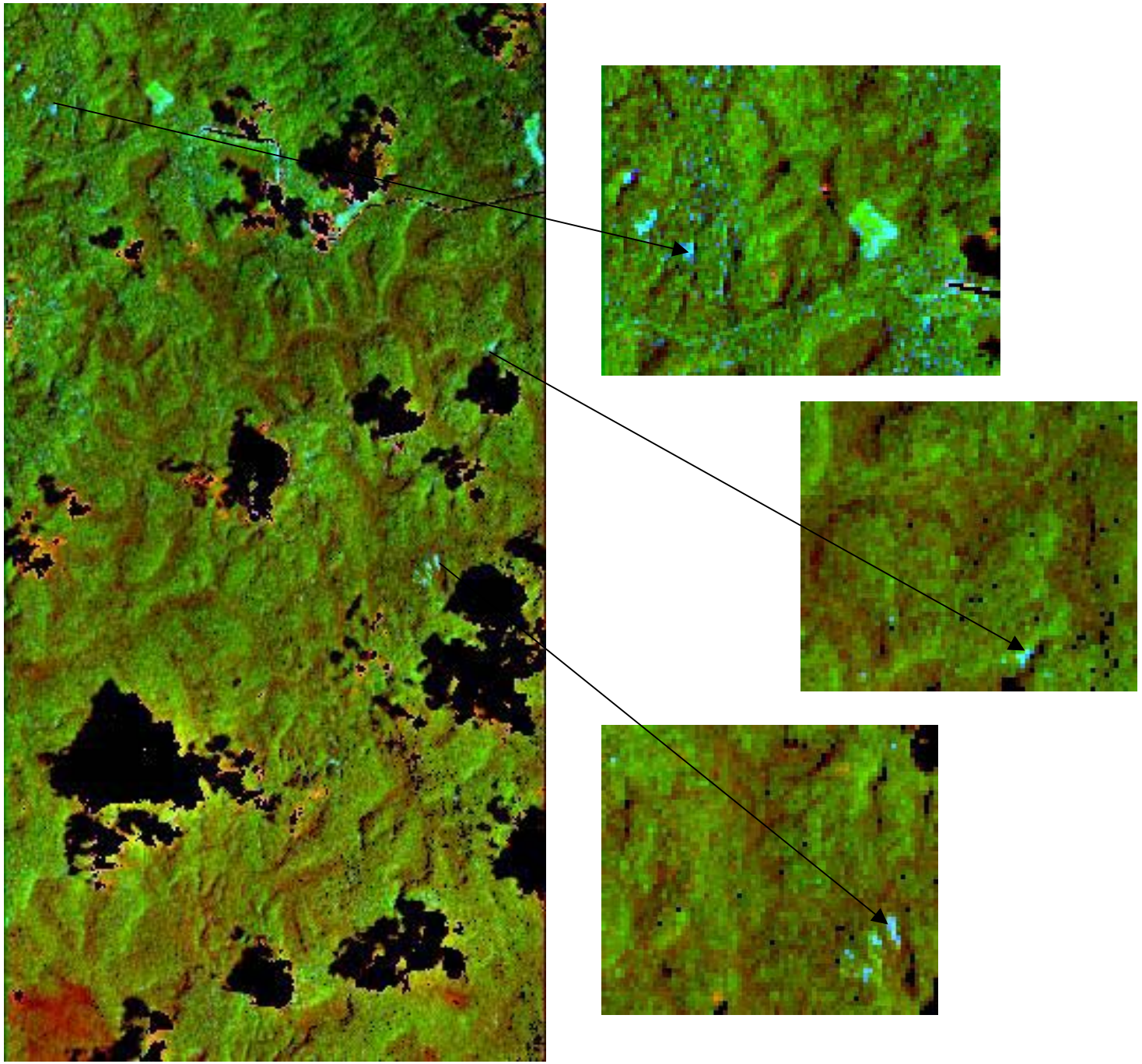


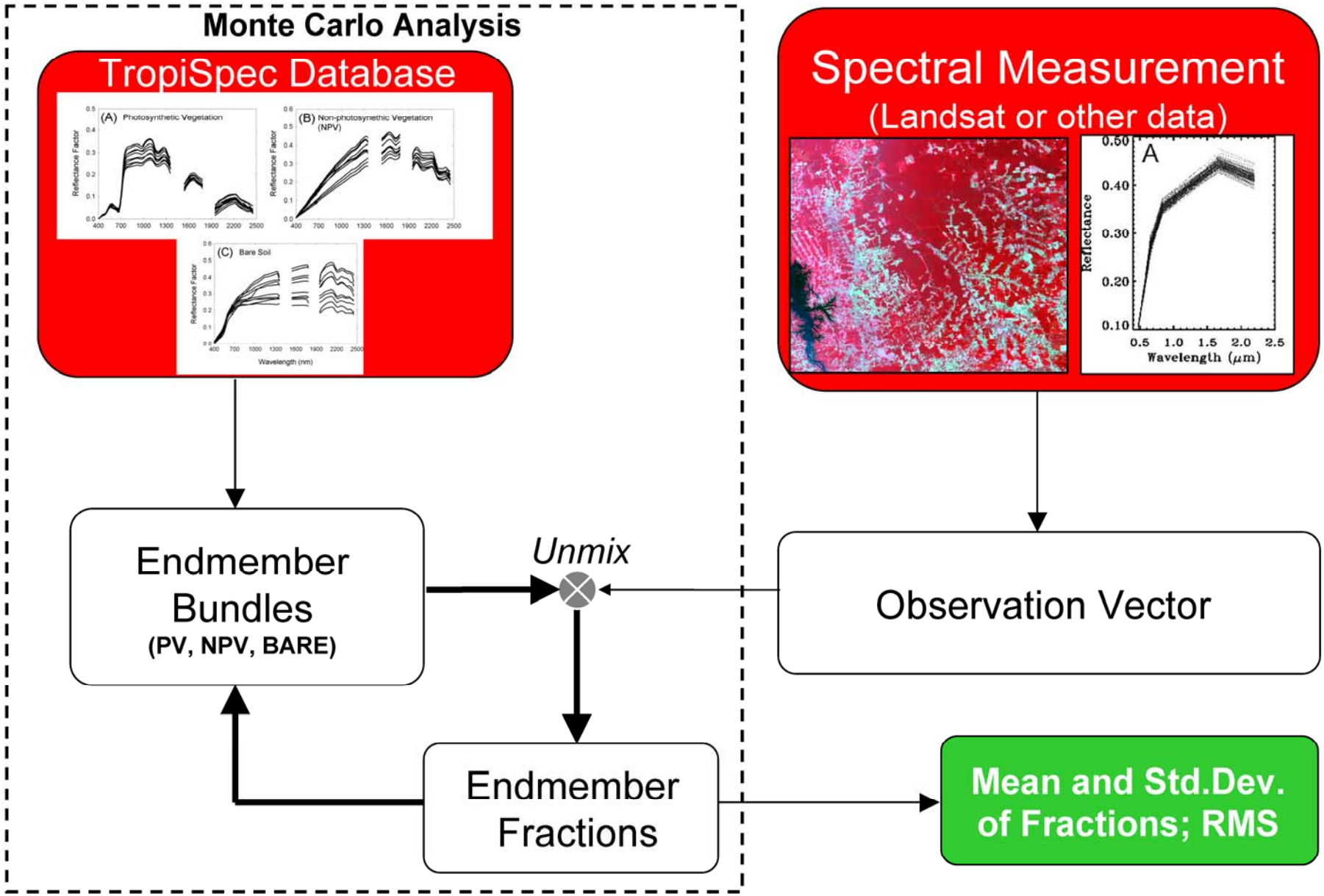
Development of a PDF for all event size classes

Event Class	Fine Scale	Fine-Mid Scale	Mid-Scale	Large Scale
Size	One tree to 5% mortality	5 to 50% mortality	50 to 100% and < 1 ha	100% and > 1 ha
Methods	Forest Inventory Plots	Ikonos, Quickbird	Hyperion	Landsat
Researchers	RAINFOR, LBA, others	Palace	Chambers, Asner	Asner, Souza, Nelson, Roberts



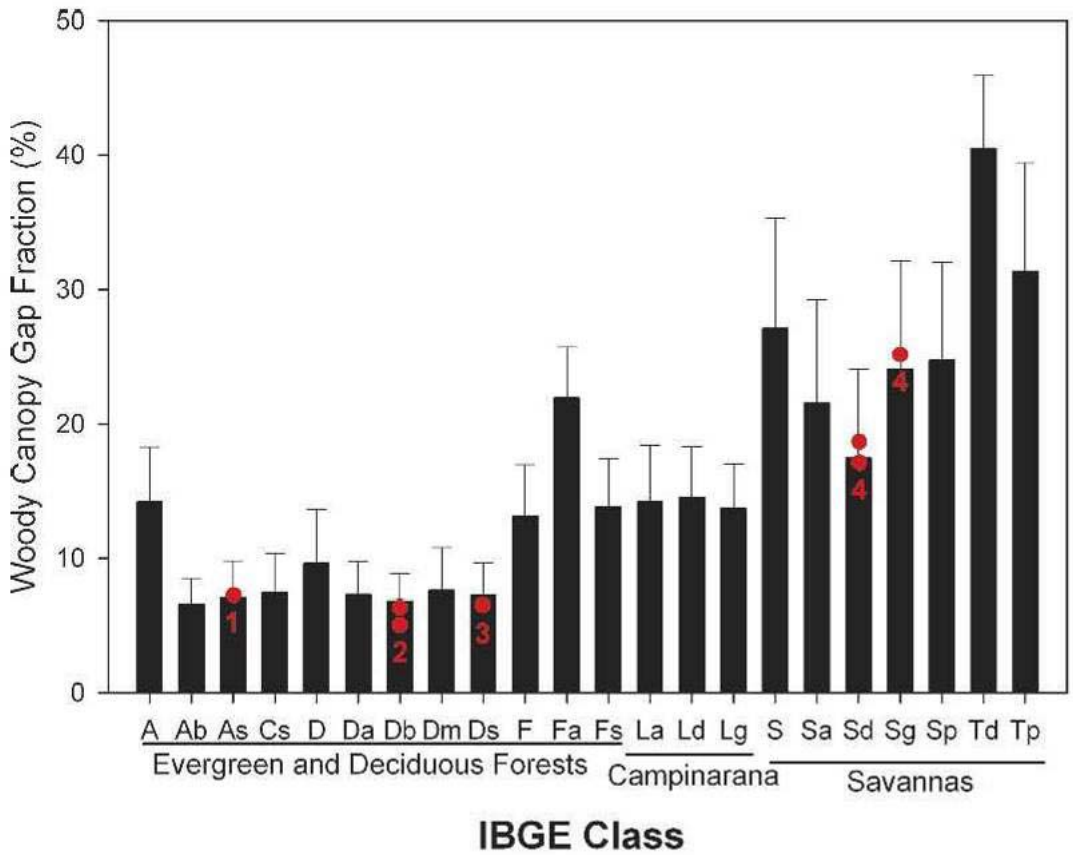

Legend:
Forest site locations with corresponding codes
BCI
CRS
RIO
ELD
CEL
PAR
NOR
SCR
CYB
TIP
JAS
BOG
CAQ
SUC
YAN
MSH
ALP
JEN
BNT
BDF
JAC
JRI
TAP
CAX
MBO
CAR
MAR
MNU
PAK
INF
CUZ
TAM
CRP
LSL
LFB
Panama
Venezuela
Guyana
Suriname
French Guiana
Colombia
Ecuador
Peru
Brazil
Bolivia
500
Kilometers




Monte Carlo Analysis
TropiSpec Database
(A) Photosynthetic Vegetation
(B) Non-photosynthetic Vegetation (NPV)
(C) Bare Soil
Reflectance Factor
Wavelength (nm)
Spectral Measurement
(Landsat or other data)
A
Reflectance
Wavelength (μm)
Endmember Bundles
(PV, NPV, BARE)
Unmix
Observation Vector
Endmember Fractions
Mean and Std.Dev. of Fractions; RMS

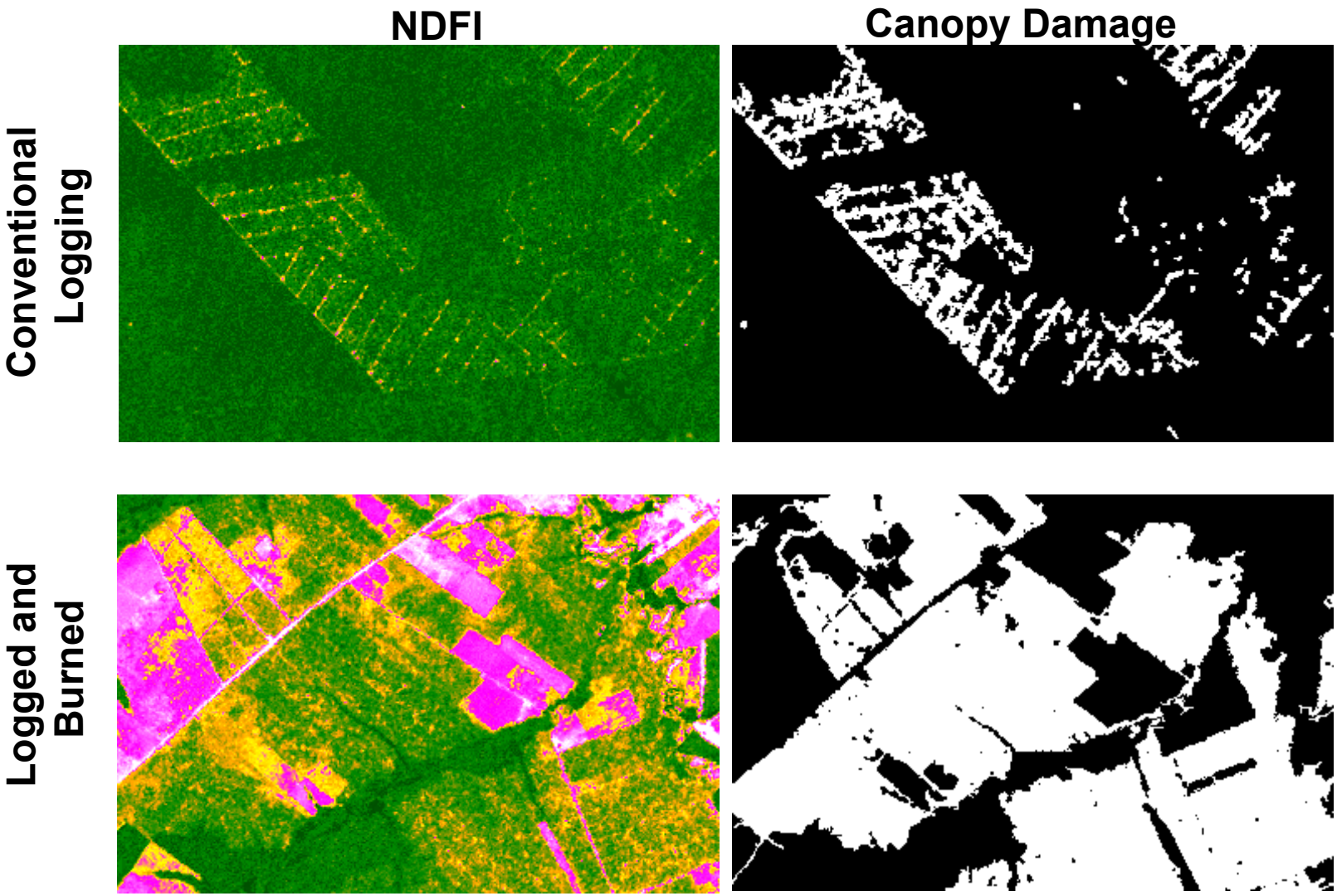
if $PV_{CLAS} < 0.85$, $GAP = (PV_{CLAS} - 90.0)/(-0.4)$

if $PV_{CLAS} \geq 0.85$, $GAP = (PV_{CLAS} - 90.0)/(-0.8)$.



Asner et al. 2005
Earth Interactions

CCA Results


NDFI
Canopy Damage
Conventional Logging
Logged and Burned

Mean Wood Residence Time