

Mid-Atlantic Regional Climate Symposium
Climate Change and The Tropics: Implications and Adaptation
November, 21st 2014

Environmental disturbances and land systems in the tropics

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<http://landchange.rutgers.edu>



The New York Times

The Opinion Pages | OP-ED CONTRIBUTOR

To Save the Planet, Don't Plant Trees

By NADINE UNGER SEPT. 19, 2014

Email

NEW HAVEN — AS international leaders gather in

People
And
Reforestation in the
Tropics: a
Network for
Education,
Research, and
Synthesis



Bringing natural and social scientists together to address the complexity of socio-ecological processes that shape reforestation in the tropics.

“The science says that spending precious dollars for climate change mitigation on forestry is high-risk: We don't know that it would cool the planet, and we have good reason to fear it might have precisely the opposite effect”.

Scientists rebut NYTimes op-ed 'To Save the Planet, Don't Plant Trees'

Commentary by Daniel Nepstad and colleagues
September 22, 2014



print

Editor's Note: The following is a response from a group of scientists' — including 6 members of the National Academy, 3 IPCC Lead Authors, and 1 IPCC Co-Chair — to Dr. Nadine Unger's September 21, New York Times Op-Ed, "To Save the Planet, Don't Plant Trees"

Union of
Concerned
Scientists

The Equation

a blog on independent science + practical solutions

Misleading New York Times Op-Ed on Forests, but Real Progress on Ending Deforestation

September 23,
2014

Doug Boucher, sr. scientist & dir., Climate Research and Analysis



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I'm in New York City for the United Nations Climate Summit, and it's an important week for tropical forests and the global climate.

“Forests also cool the atmosphere because they convert solar energy to water vapor, which increases sky albedo (or reflectivity) via cloud formation. ***This effect is particularly strong in the tropics***”

“**Tropical forests** provide a cooling effect through the long-term removal of carbon from the atmosphere and by increasing sky albedo via cloud generation”



Pan et al, 2011. Science, Vol 333

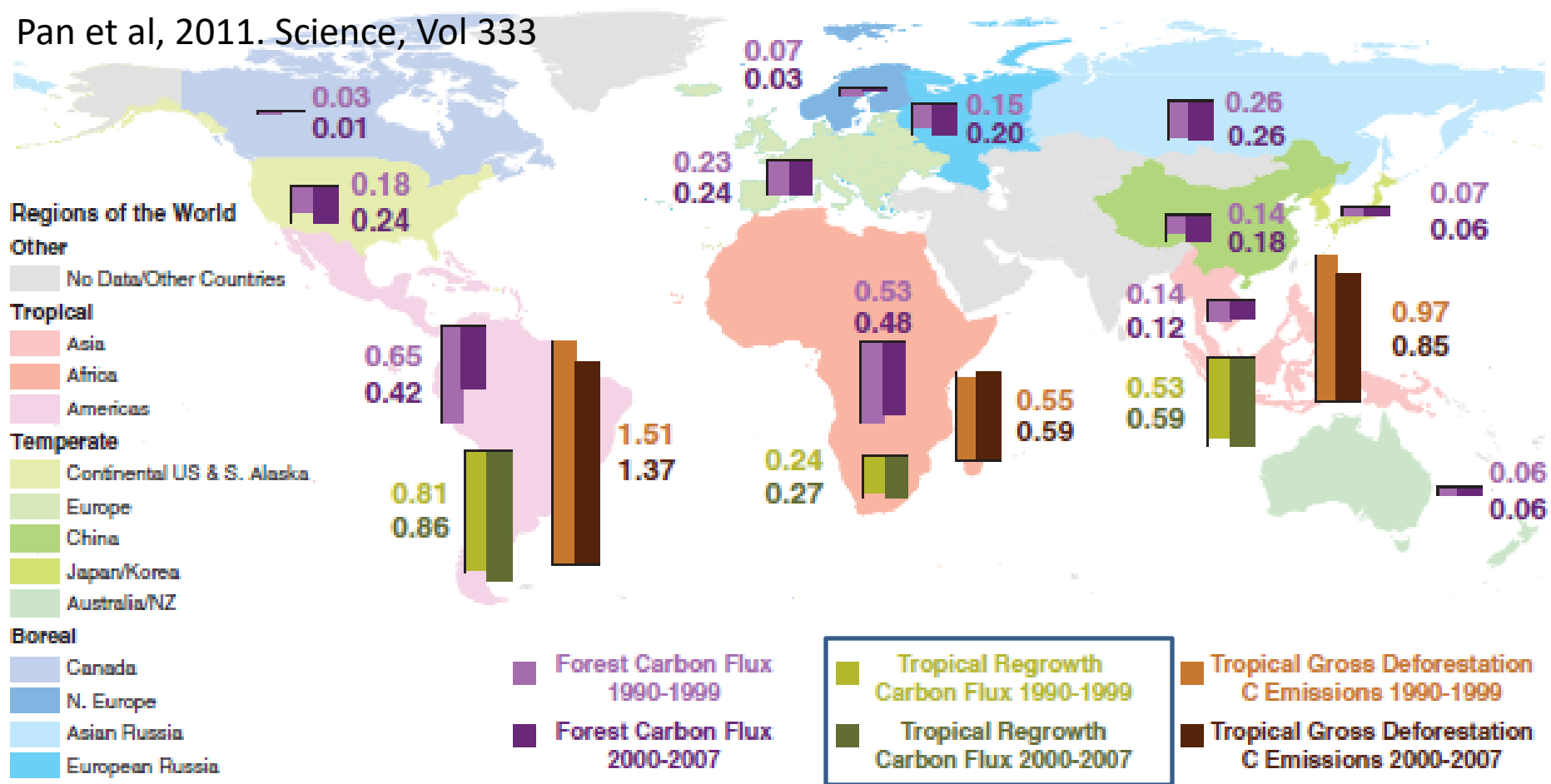


Fig. 1. Carbon sinks and sources (Pg C year^{-1}) in the world's forests. Colored bars in the down-facing direction represent C sinks, whereas bars in the upward-facing direction represent C sources. Light and dark purple, global

established forests (boreal, temperate, and intact tropical forests); light and dark green, tropical regrowth forests after anthropogenic disturbances; and light and dark brown, tropical gross deforestation emissions.

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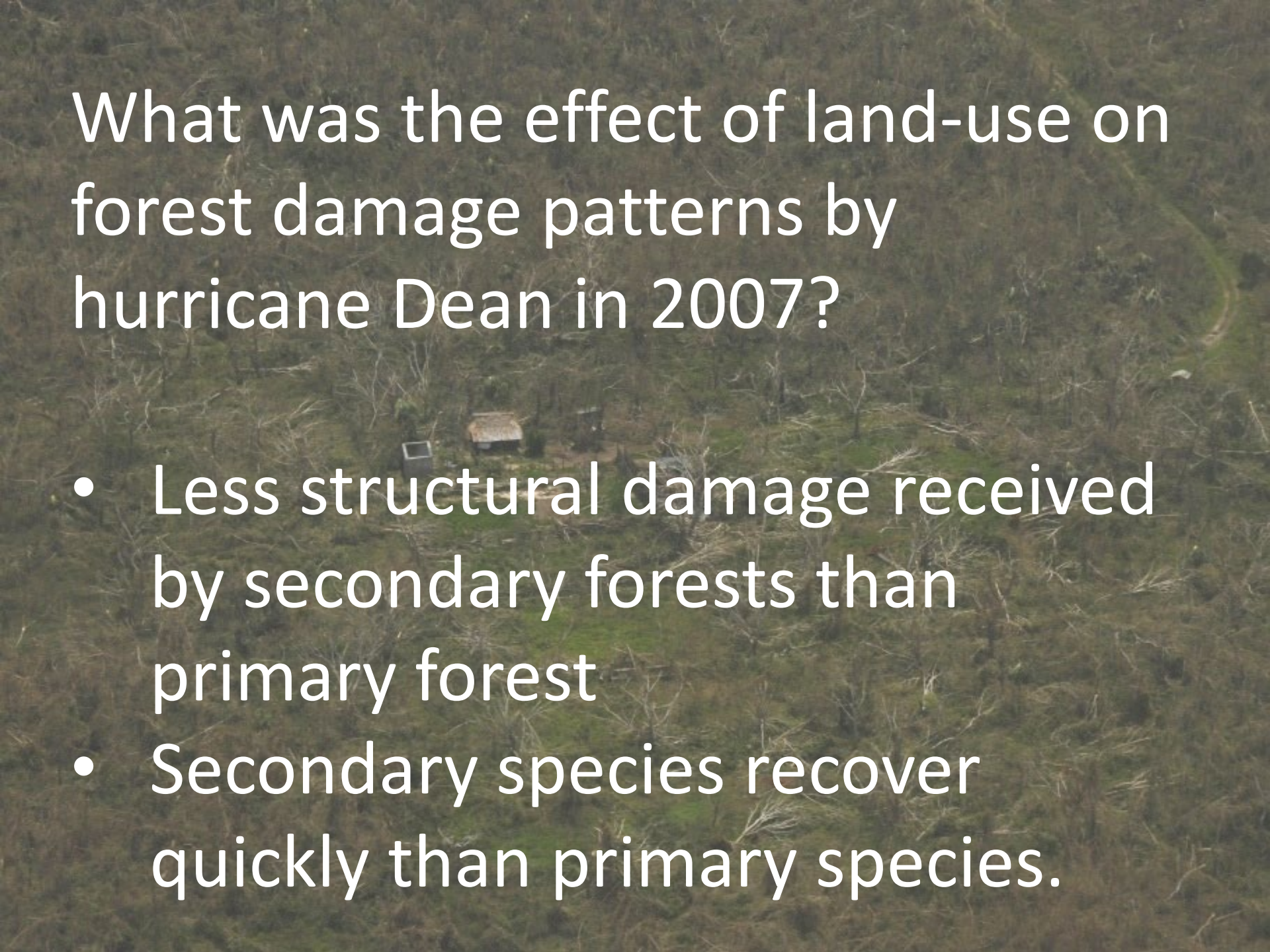
**The relations of forest damage and recovery after
hurricane disturbance in Southern Yucatán,
Mexico**

Laura Schneider - Rutgers University
<http://landchange.rutgers.edu>



Understanding Environmental Disturbances of Dry Tropical Forest

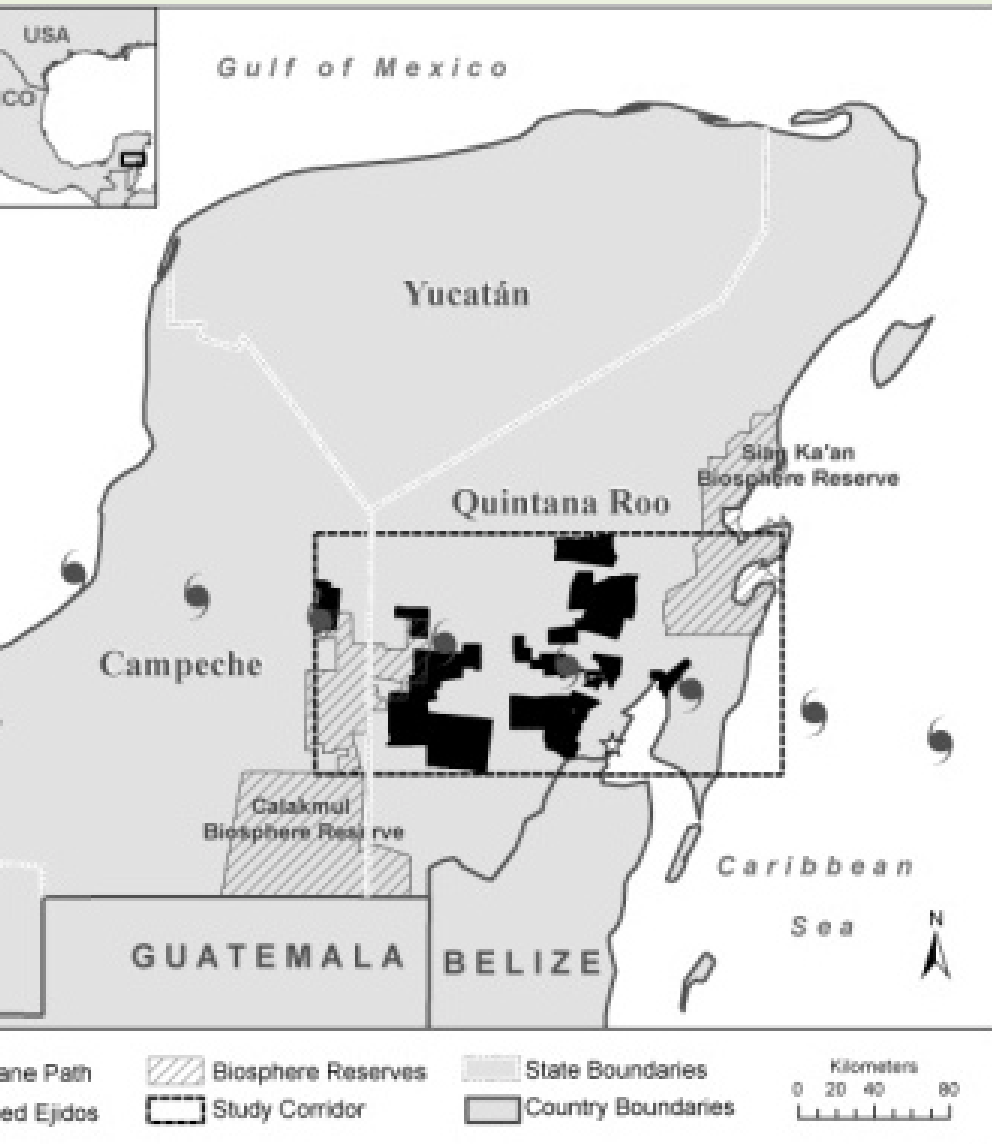
- How environmental disturbances relate to forest resilience in the **Biological Corridor of Calakmul-Sian Kaan in Southern Yucatan Peninsula, Mexico.**
 - **Hurricanes**, droughts, wild fires
 - Landscape fragmentation, due to land-use practices (milpas, agroforestry, pastures)
- How to differentiate the effect of environmental disturbances from those caused by land-use changes, management practices?
 - Methodological challenges, scale of analysis
 - Important to understand in view of monitoring of environmental services.

An aerial photograph of a forest landscape. The forest is mostly green, but there are many bare, brown branches visible, suggesting damage from a storm. In the center-left, there is a small clearing with a small, dark, rectangular structure, possibly a shed or a small house. The text is overlaid on the top half of the image.

What was the effect of land-use on forest damage patterns by hurricane Dean in 2007?

- Less structural damage received by secondary forests than primary forest
- Secondary species recover quickly than primary species.

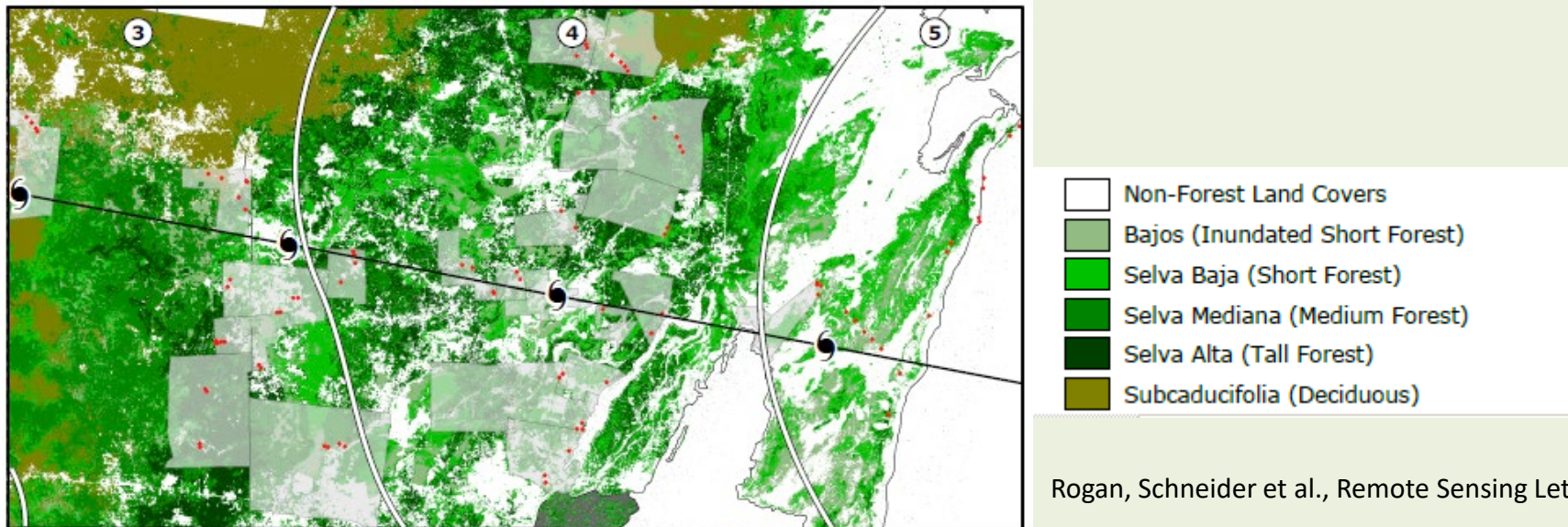
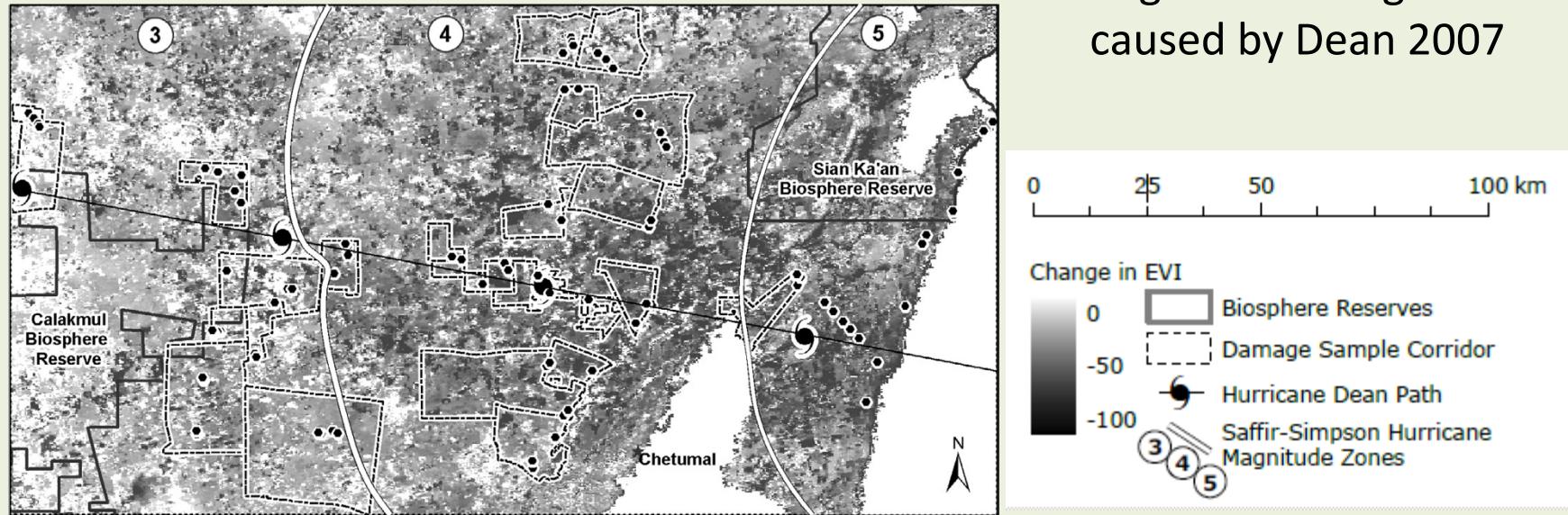
Data and Methods



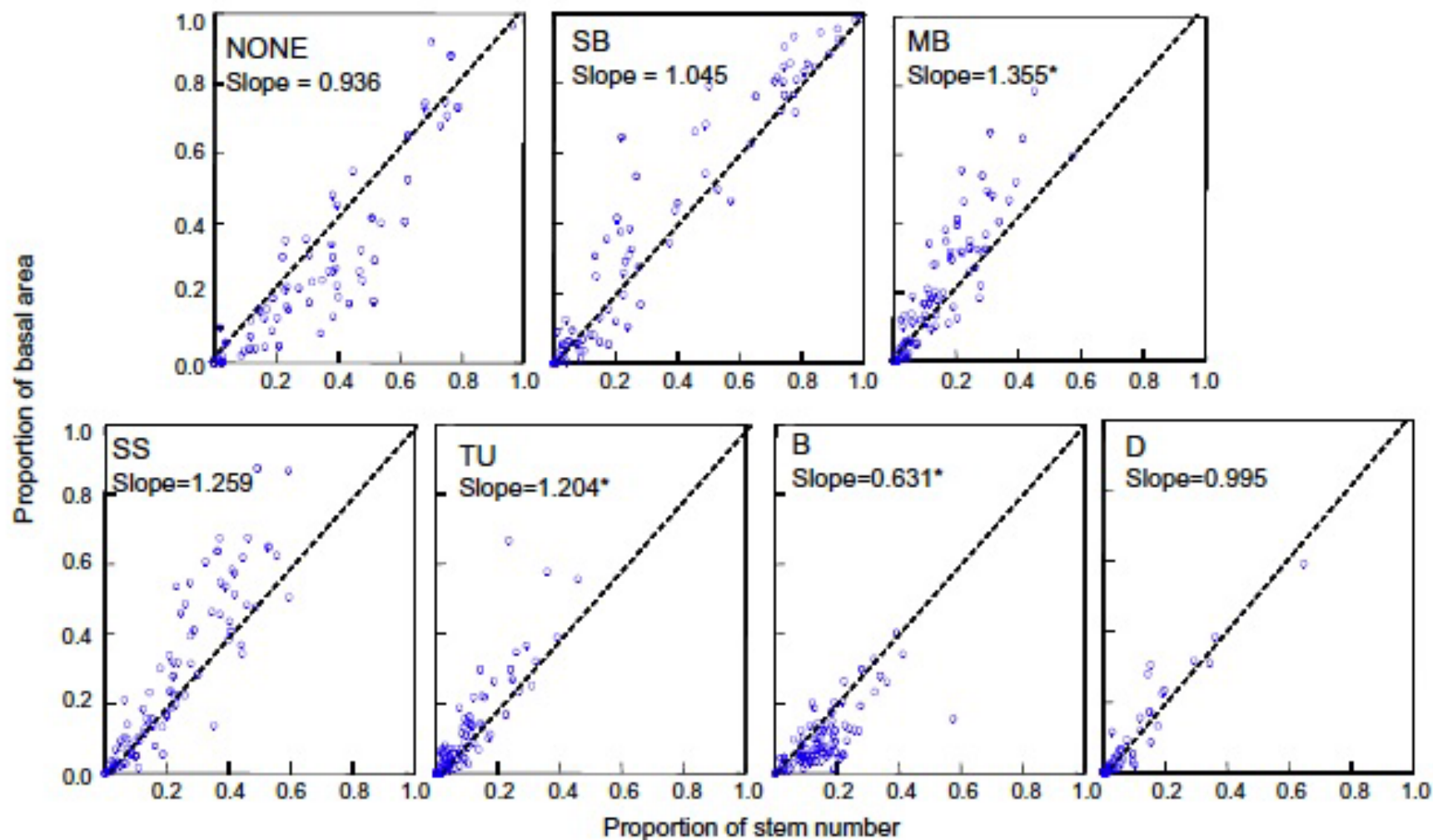
- Damage measured by analysis of MODIS EVI data (Pixel size 250 m²)
 - Time series analysis of EVI data 2001-2013
- 90 plots in MBC to measure local damage (100m²) y 250m² MODIS to validate MODIS data. 2007.
 - Damage type for each tree with 5cm dbh or larger. Species identification.
- 28 plots to monitor forest damage and recovery 2007-2013.
 - Damage and recovery by individual tree with 5 cm dbh or more. Species identification.

Results

- Regional Damage caused by Dean 2007



Results: Forest Structural Damage

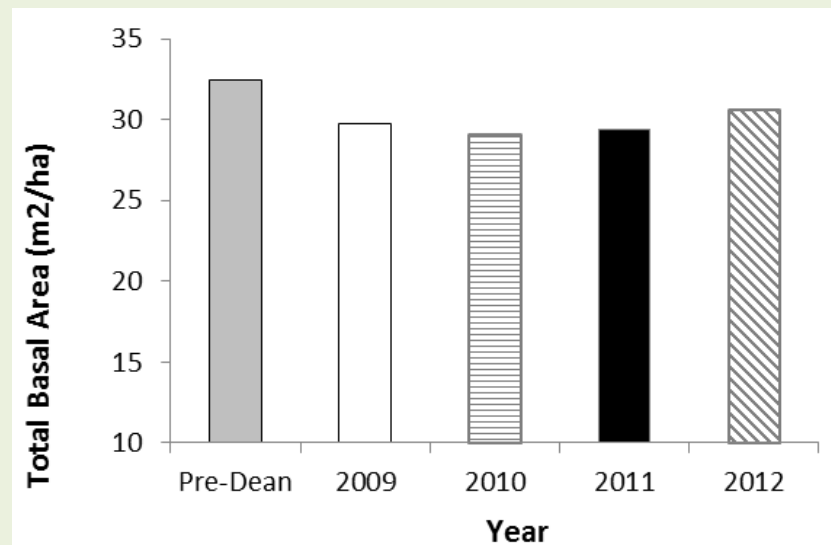
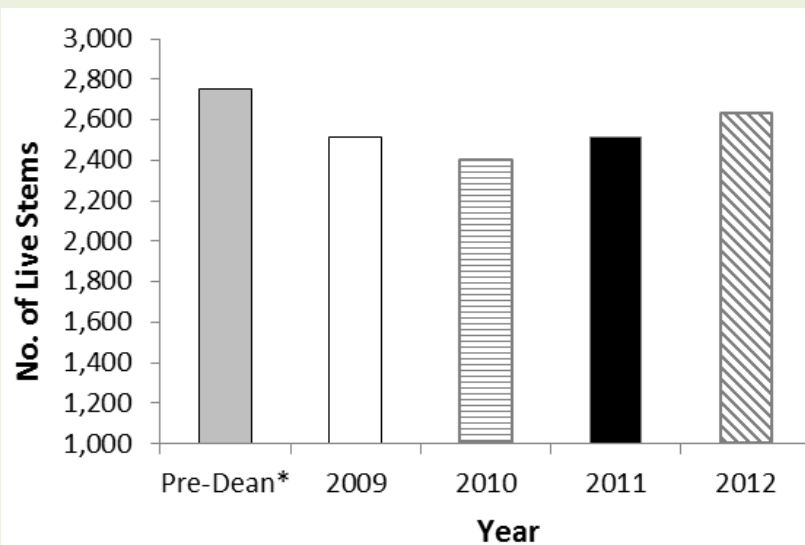


McGroody, Lawrence,
Schneider et al., 2013.
*Forest Ecology and
Management.*

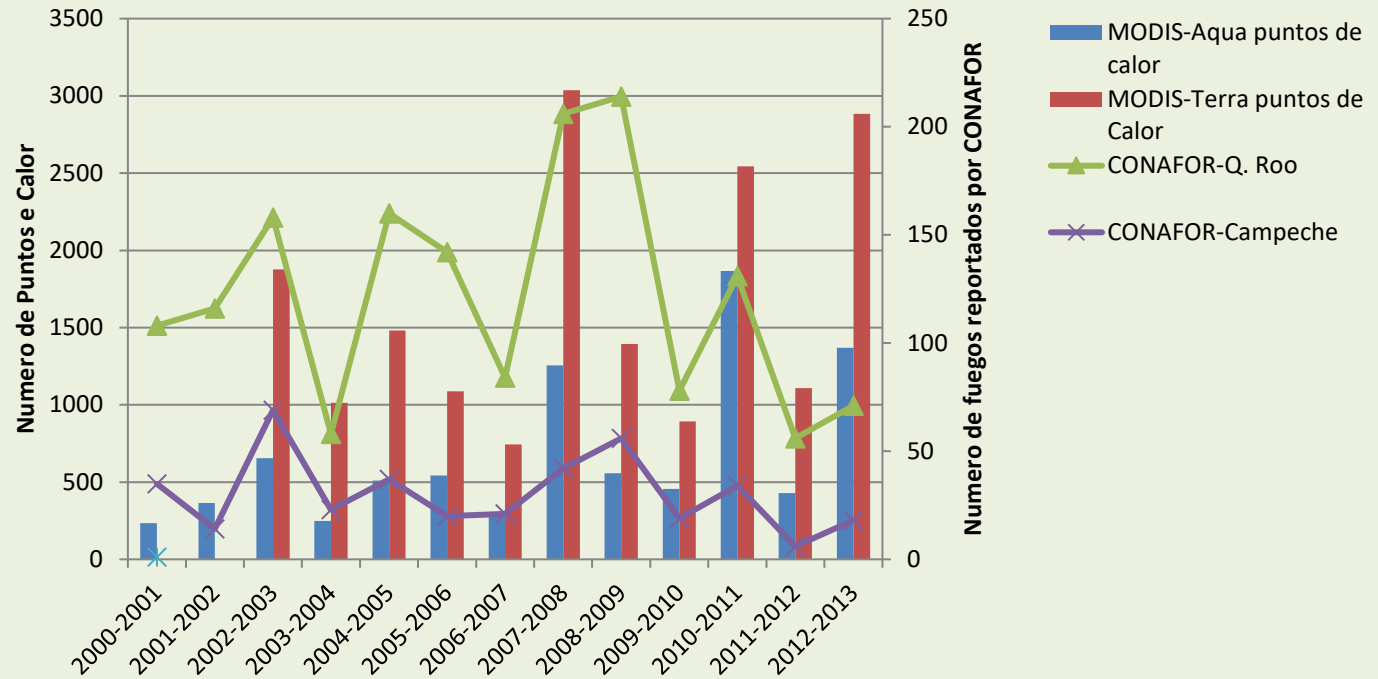
Damage monitoring and Recovery

	2008*	2009		2012	
Damage Class	Average % of affected stems	Average % of affected stems	Average % of affected basal area	Average % of affected stems	Average % of affected basal area
None	27.0	11.0	11.4	52.4	49.3
SB	22.0	42.2	31.5	5.7	4.2
MB	11.0	8.2	20.7	5.1	9.6
B	10.0	10.9	7.4	7.8	5.5
SS	18.0	16.1	17.5	5.3	5.5
TU	7.0	2.7	2.5	1.8	1.1
D	5.0	8.7	8.7	14.6	21.8
DNH		0.1	0.1	4.6	3.0
CUT/FIRE		0.2	0.1	2.7	0.1

Regrowth and significant structural recovery were evident within the first five years after the damage caused by hurricane Dean



How to link hurricane damage to other disturbances such wildfires?
Land-use could create forest more resilient to hurricane winds but other
disturbances such wild fires could affect forest substantially



Land-Use

*Agroforestry/
Milpas*

*Pastures,
cattle ranching*

Environmental Disturbances

Droughts:
Species
tolerant to
droughts,
increased in
deciduous
species

Hurricanes: Species
of secondary forest
more common, less
trees with high basal
areas and high wood
density. Rare species
more vulnerables to
wind distrurbances.

**Forest
Fragmentation**

Wild Fires

- More frequent, increase of areas
damage by fire

Damage patterns after Hurricane Dean (2007) in the southern Yucatan: has human activity resulted in more resistant forests?

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Megan McGroody- University of Virginia

Deborah Lawrence- University of Virginia

John Rogan - Clark University

Irene Zager- Provita, Venezuela

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