COASTAL BLUE CARBON IN THE GULF OF MEXICO

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Carlota Santos

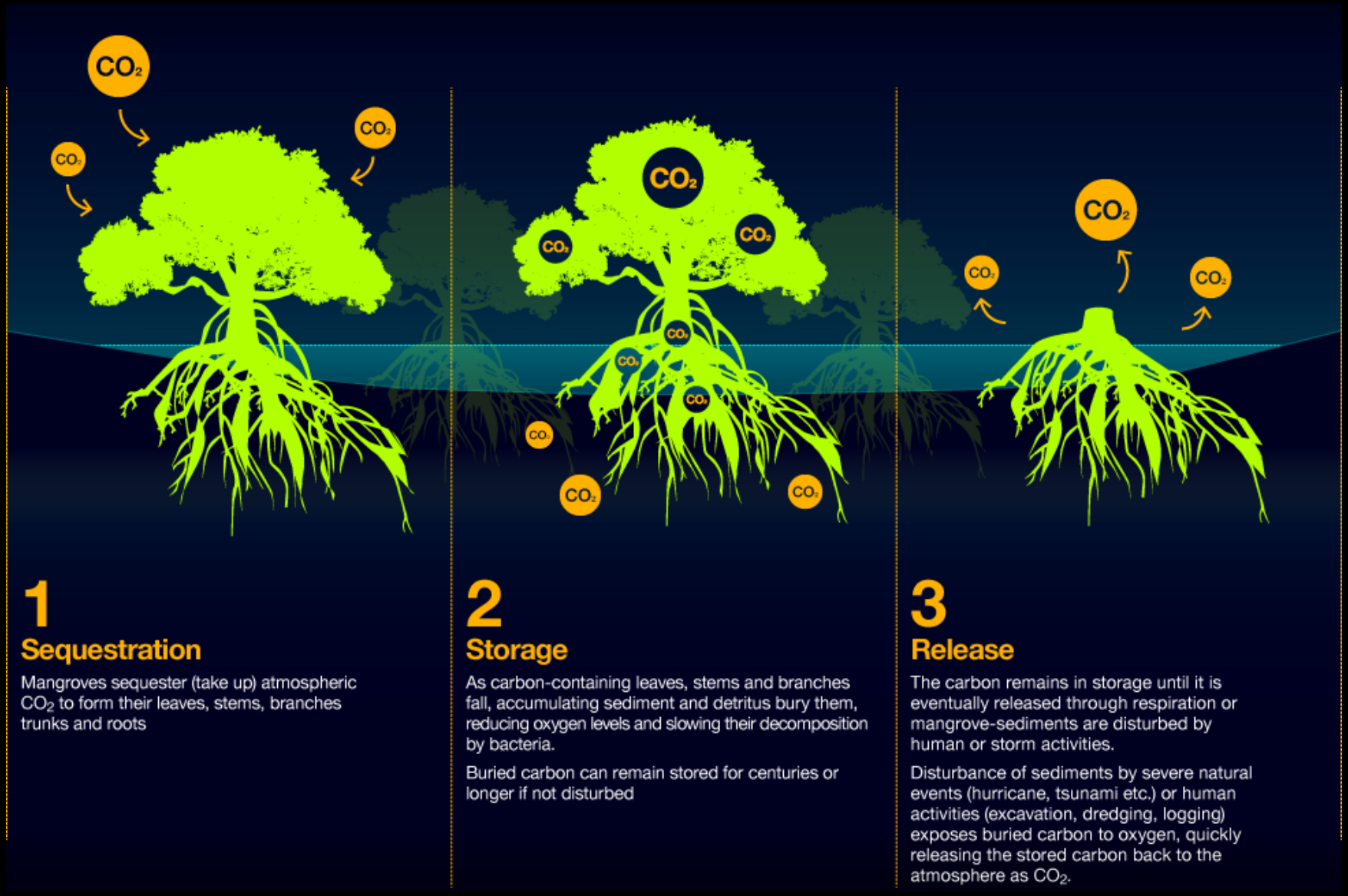
5/31/2016

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

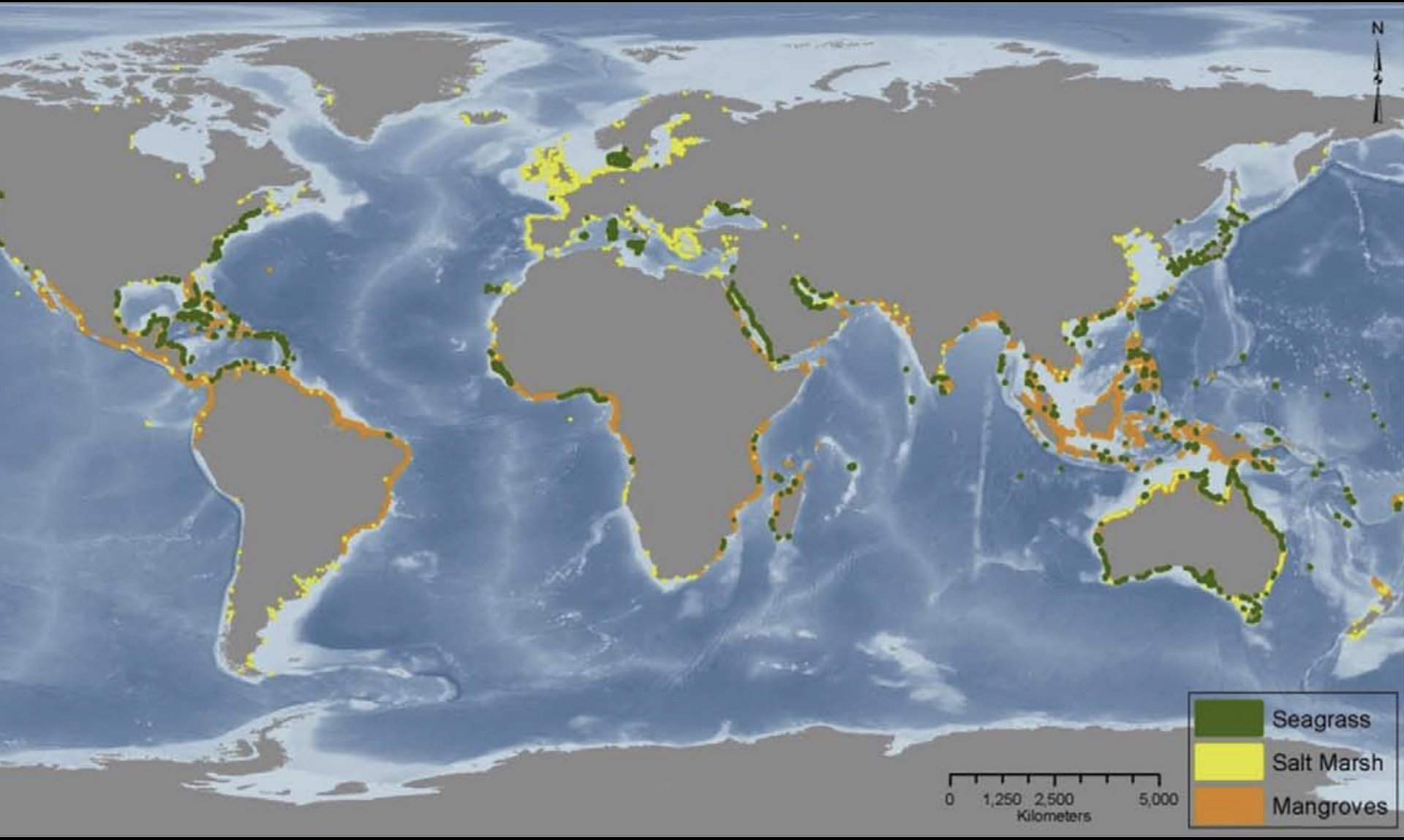
Coastal Blue Carbon Ecosystems

NOAA

Components Of Blue Carbon

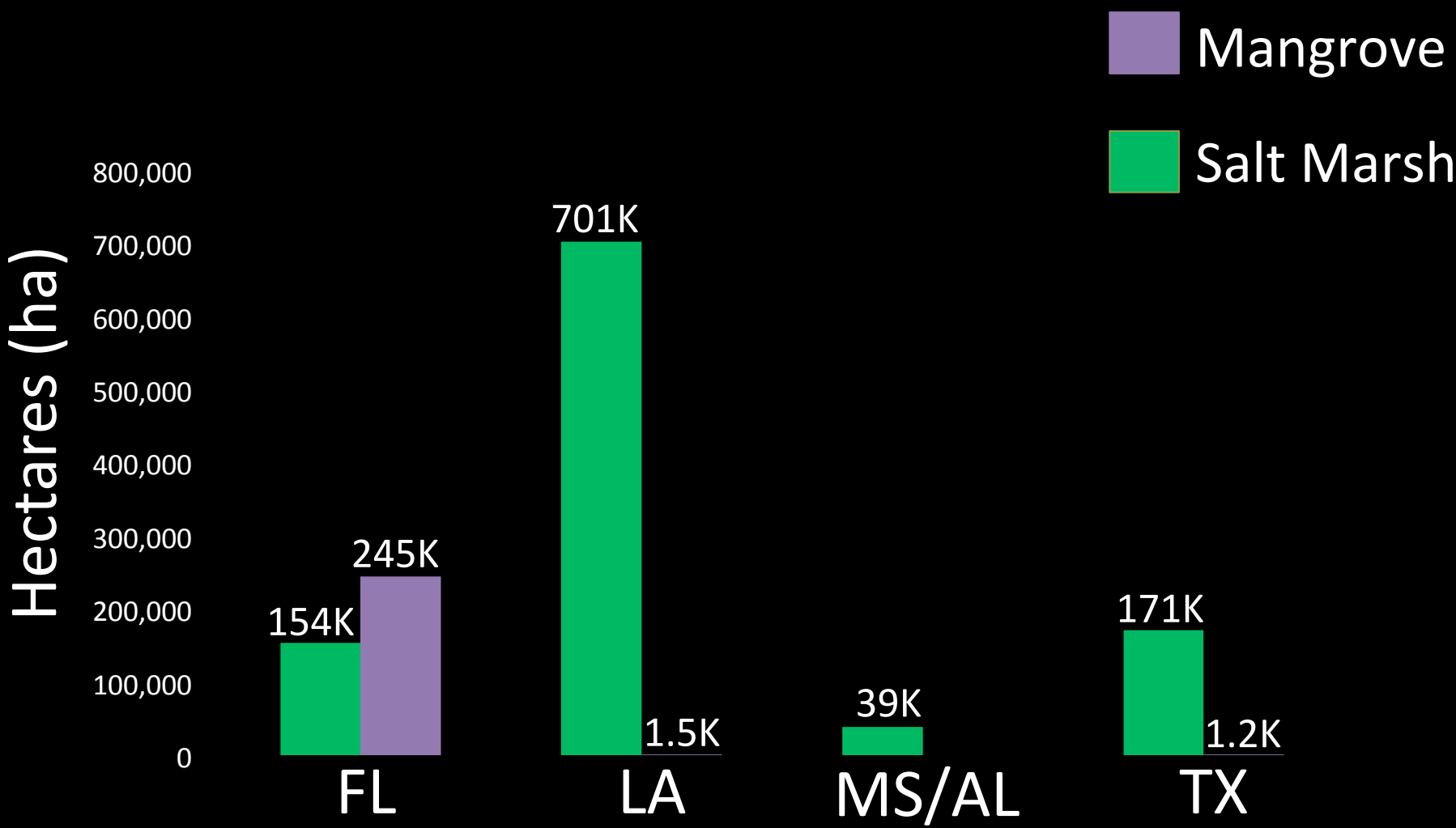


Global Distribution



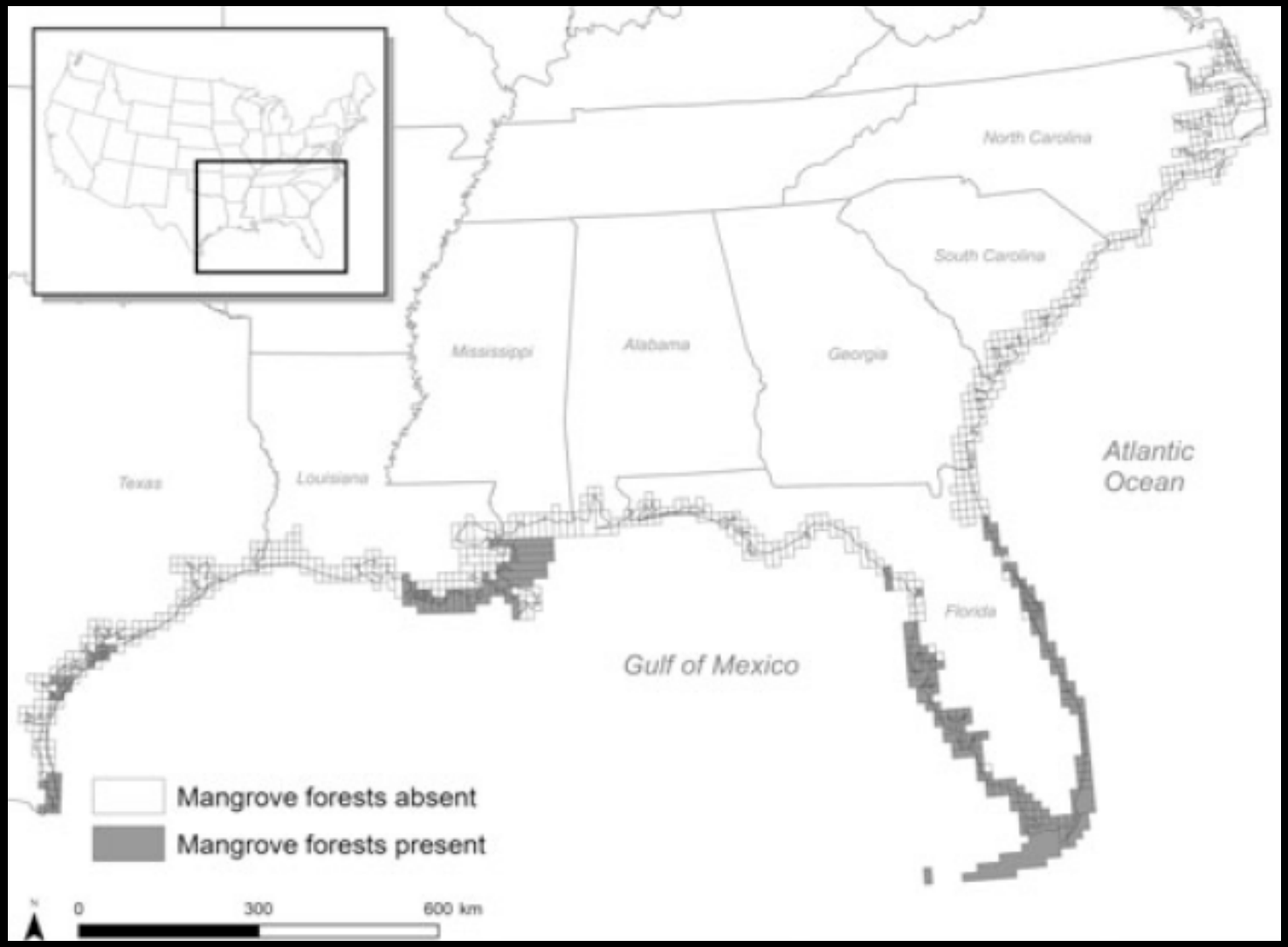
Pendleton et al 2012

Northern GOM Distribution



National Wetlands Inventory data

Mangroves Are Migrating Northward in the GOM



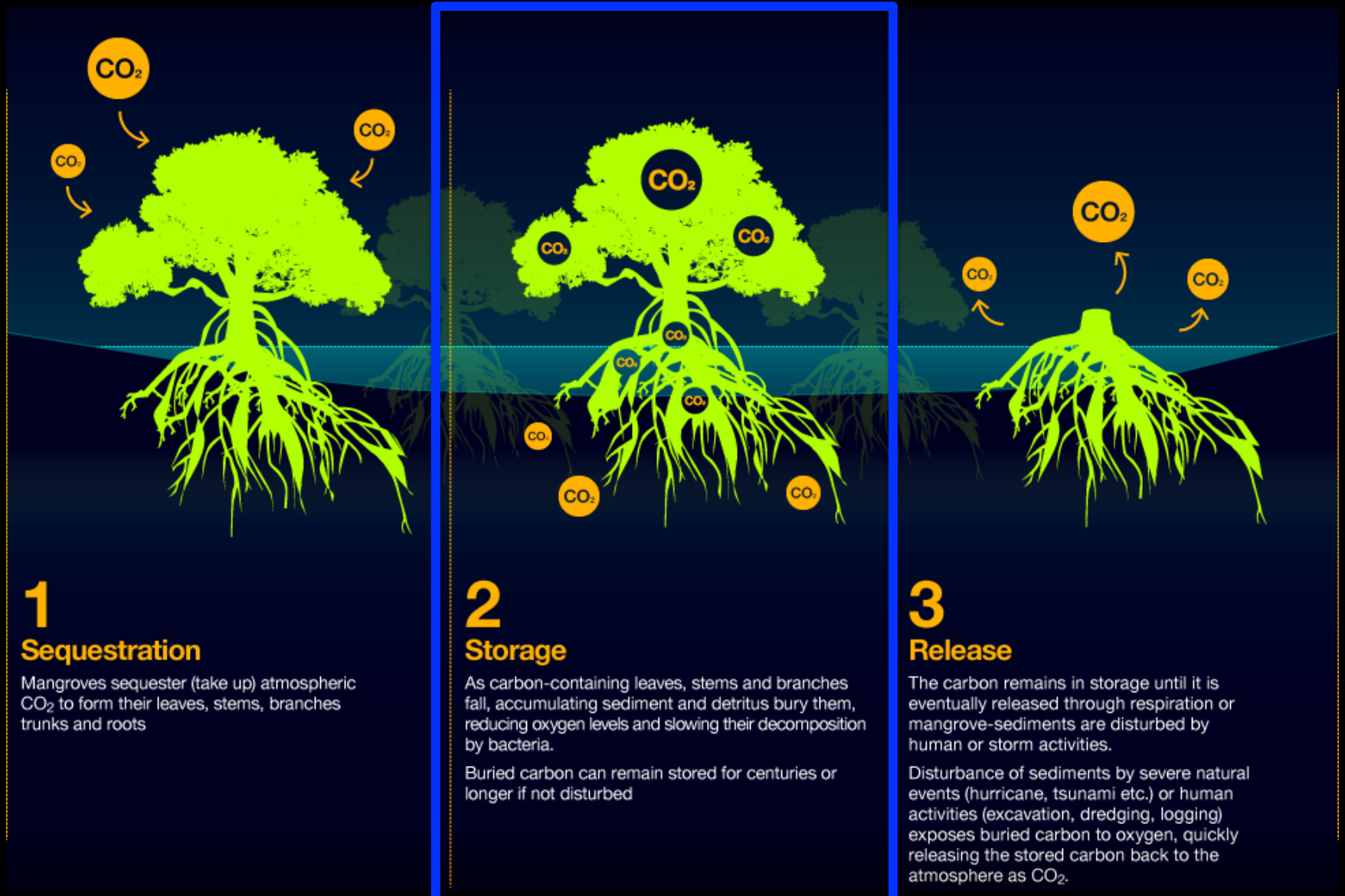
Osland et al. 2013

Mangroves Are Expanding In Texas Coastal Wetlands

Mud Island, TX

Comeaux et al. 2012

Components Of Blue Carbon



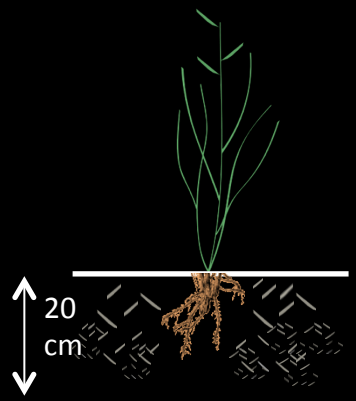
Meta-Analysis

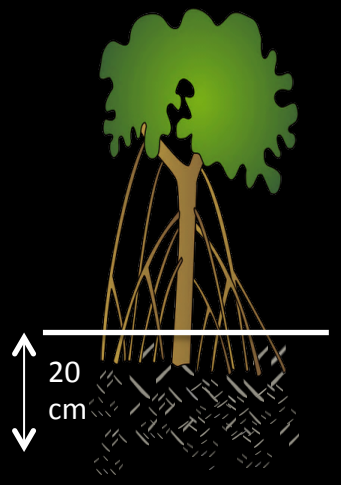
CARBON STORAGE

Aboveground Biomass

Belowground Biomass

Soil Carbon





Meta-Analysis

- Data was classified 3 ways:

Meta-Analysis

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- Analyses were conducted to determine if **mean**, **one-time**, and **peak** datasets could be combined to create more robust datasets

Meta-Analysis

SALT MARSH

AGB (mean)

BGB (mean + one time)

SC (mean + one time)

MANGROVE

AGB (no data)

BGB (minimal data)

SC (one time)

Meta-Analysis

SALT MARSH

AGB (n = 24)

BGB (n = 34)

SC (n = 44)

MANGROVE

AGB (n = 0)

BGB (n = 14)

SC (n = 38)

Meta-Analysis

SALT MARSH

AGB (n = 24)

BGB (n = 34)

SC (n = 44)

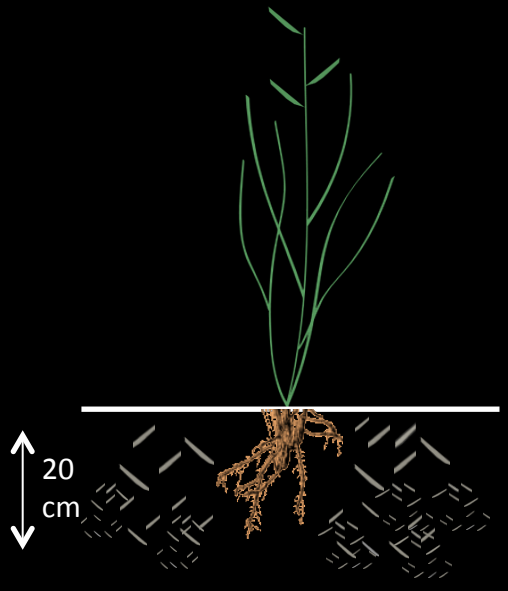
MANGROVE

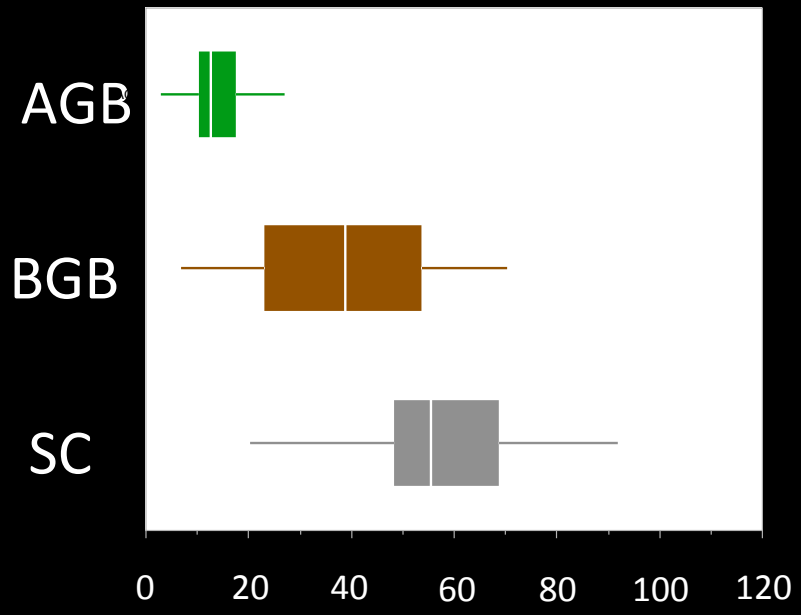
~~AGB (n = 0)~~

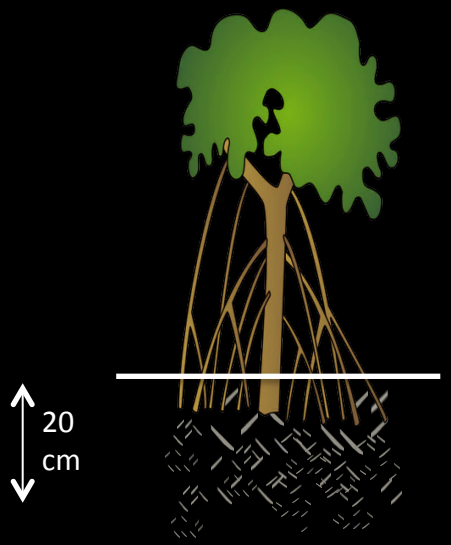
~~BGB (n = 14)~~

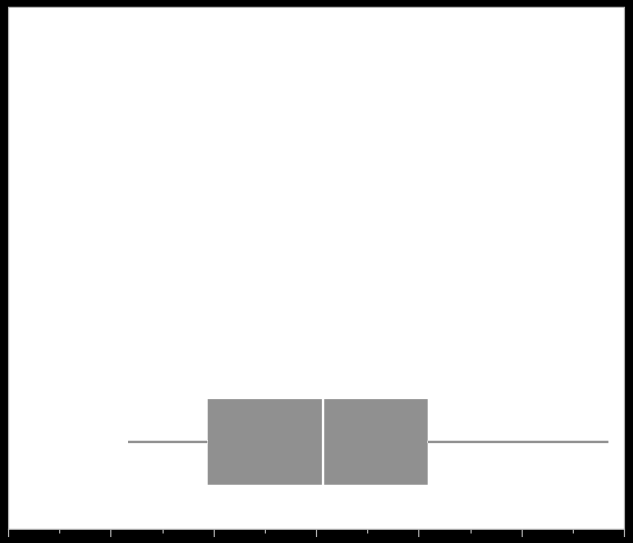
SC (n = 38)

CARBON STORAGE (tons C /ha)









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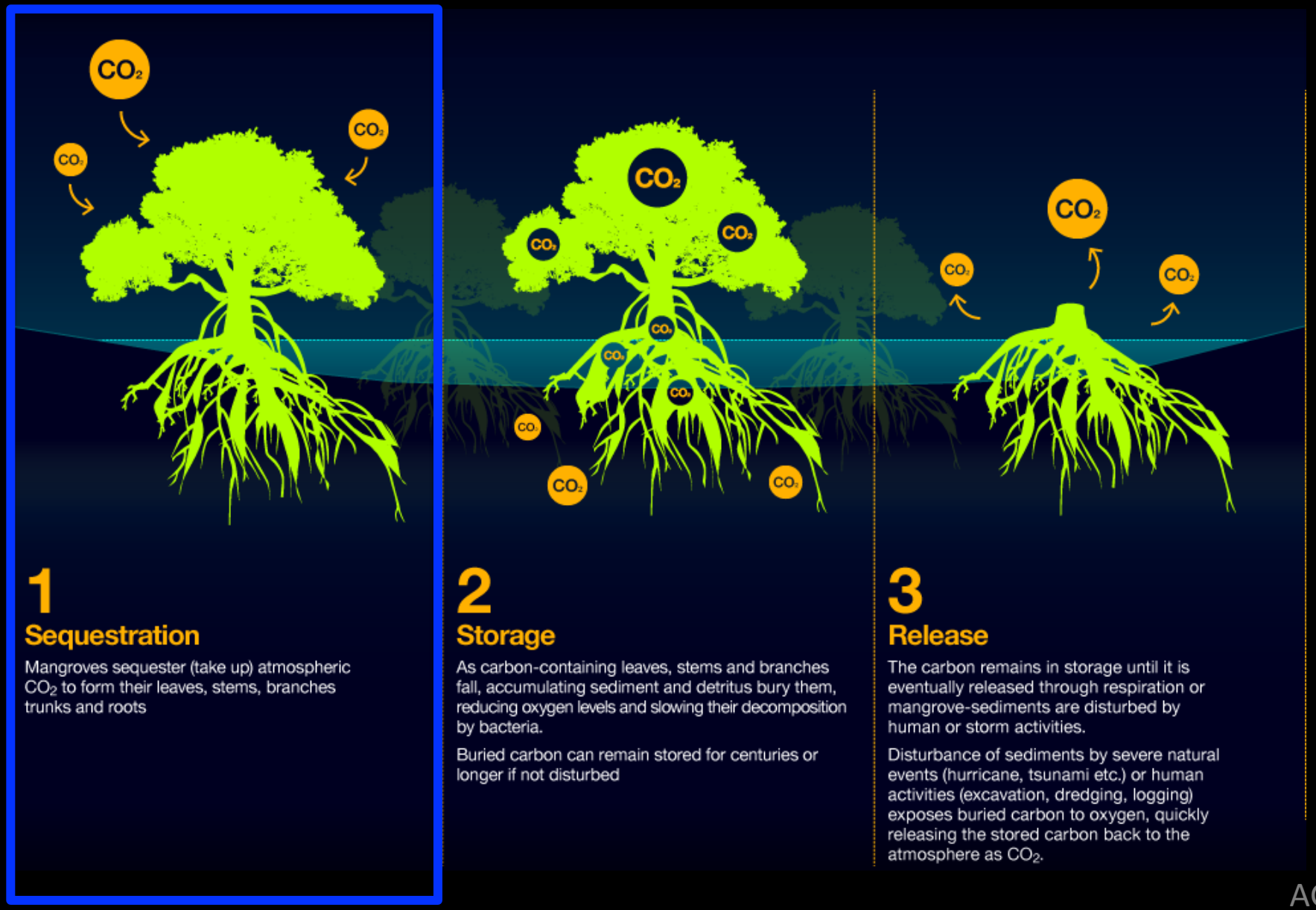

Carbon Sequestration Rates

State	Salt Marshes (tC /ha /yr)	Mangroves (tC /ha /yr)
LA	2.96	no info
TX	1.40	2.62
MS/AL	1.53	n/a
FL	0.82	1.85

Carbon Sequestration Rates

State	Salt Marshes (tC /ha /yr)	Mangroves (tC /ha /yr)
LA	2.96 (n = 23)	no info
TX	1.40 (n = 5)	2.62 (n = 2)
MS/AL	1.53 (n = 1)	n/a
FL	0.82 (n = 4)	1.85 (n = 11)

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FL	0.82 (n = 4)	1.85 (n = 11)
GOM average	2.4	1.9

Putting a Price on Carbon

Social Cost of Carbon

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Social Cost of Carbon

Show me the Money!

$tC \rightarrow tCO_2$

$1tC = 3.67\ tCO_2$

Romm, 2011

Salt Marsh Carbon Sequestration Values

State	Areal Extent	tC/ha/yr	tCO_2 /ha/yr	US$/ha/yr	US$/yr (Million)
FL	154,104	0.82	3.01	$120	$19
LA	701,369	2.96	10.86	$435	$305
MS/AL	38,591	1.53	5.62	$225	$9
TX	170,680	1.40	5.14	$206	$35
TOTAL	**1,064,745**				**$368**

US 2014 dollars

Mangrove Carbon Sequestration Values

State	Areal Extent	tC/ha/yr	tCO_2 /ha/yr	US$/ha/yr	US$/yr (Million)
FL	244,754	1.85	6.79	$272	$67
LA	1,399	2.62	9.60	$384	$0.54
TX	1,217	2.62	9.60	$384	$0.47
TOTAL	**247,370**				**$68**

US 2014 dollars

Value Of Carbon Sequestration In Northern GOM

State	Salt Marsh $ Million /year	Mangrove $ Million /year	Total $ Million /year
FL Gulf Coast	19	67	86
LA	305	0.5	306
MS/AL	9	n/a	9
TX	35	0.5	36
TOTAL	**$368**	**$68**	**$436**

US 2014 dollars

A Few Final Thoughts

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- Annual carbon sequestration rates are much less than total carbon stored, yet we tend to only value carbon sequestration potential in decision-making

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- Carbon storage in the soil is estimated to go to at least 1 meter in depth

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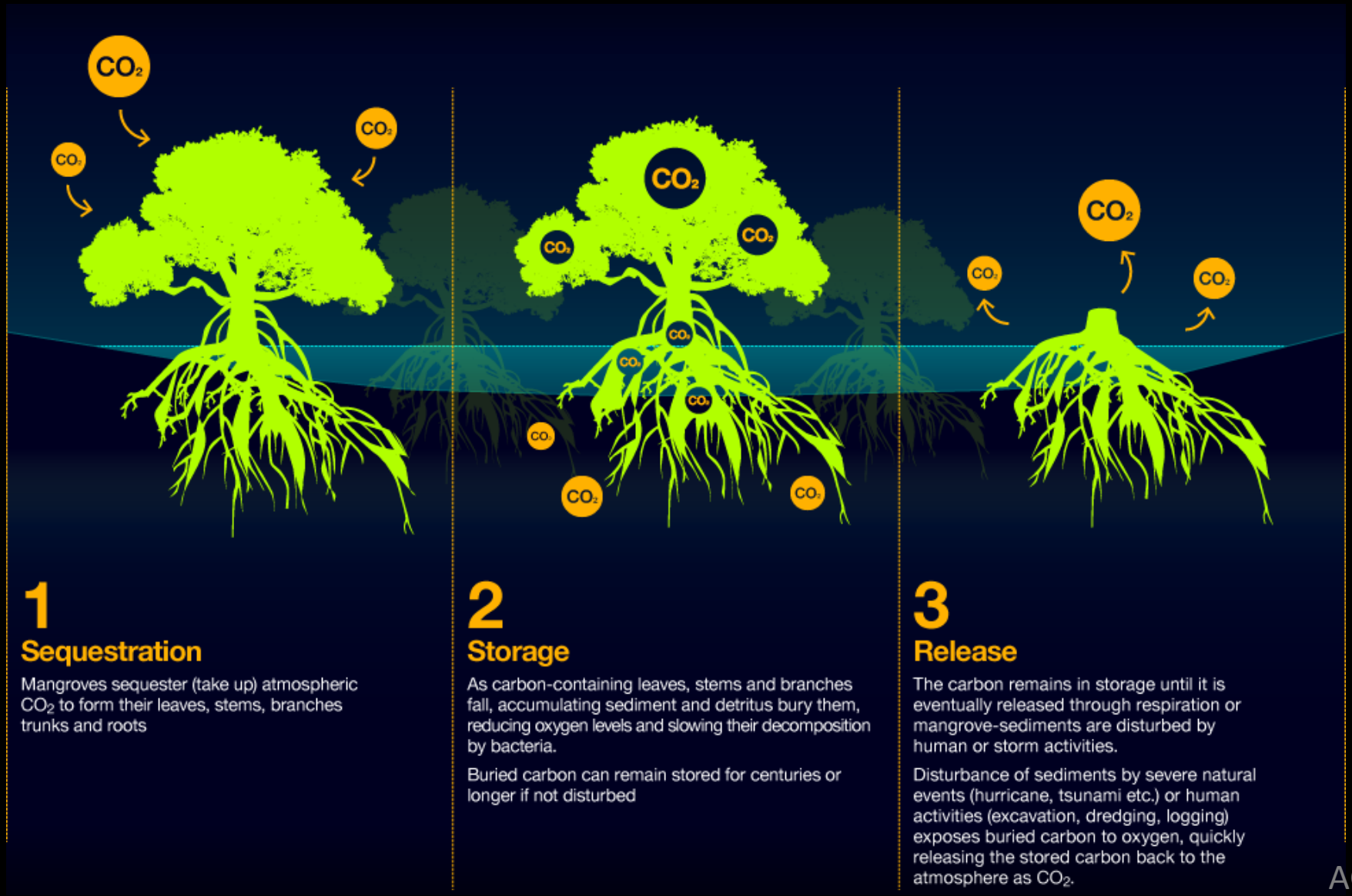

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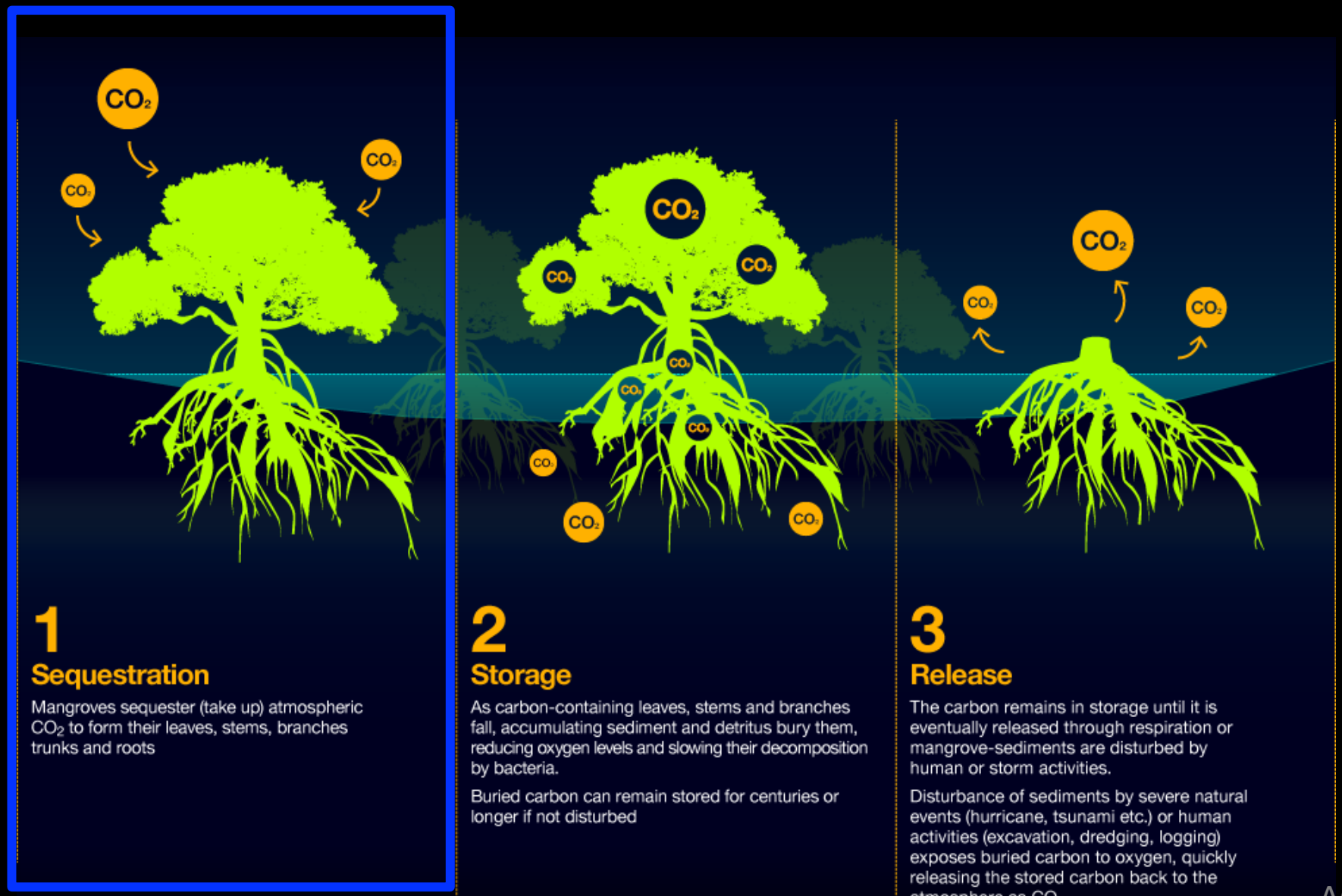

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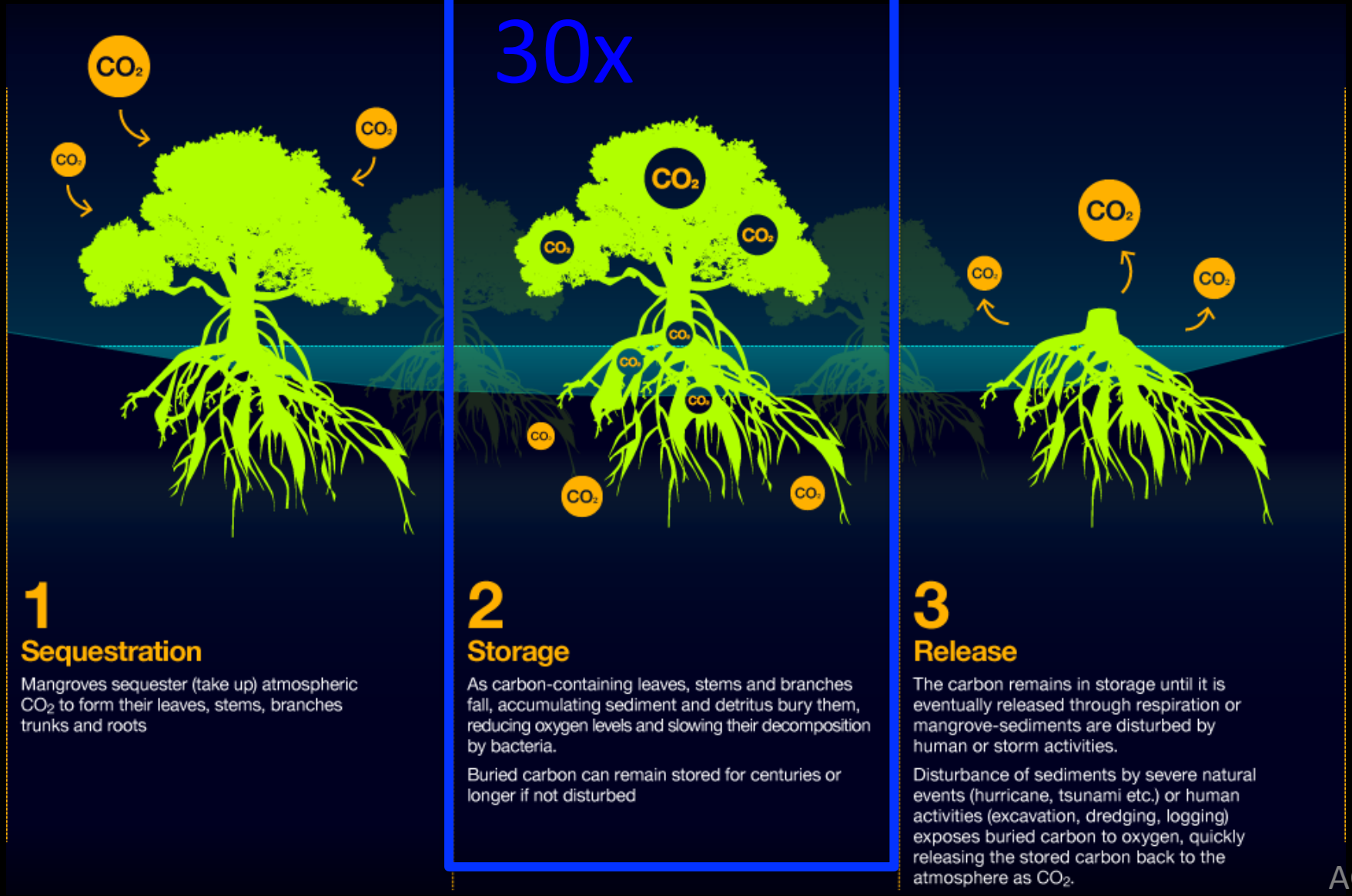

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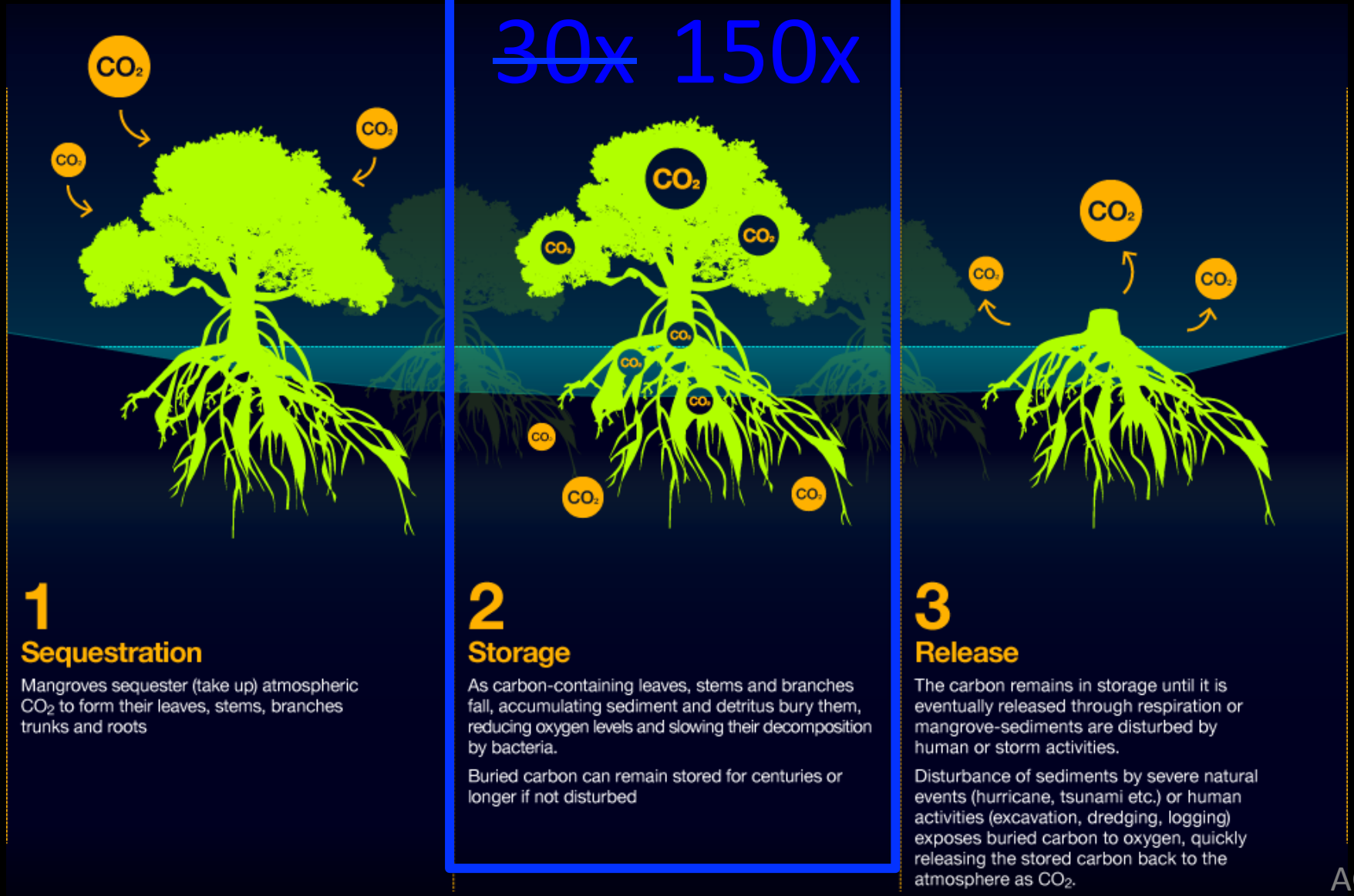

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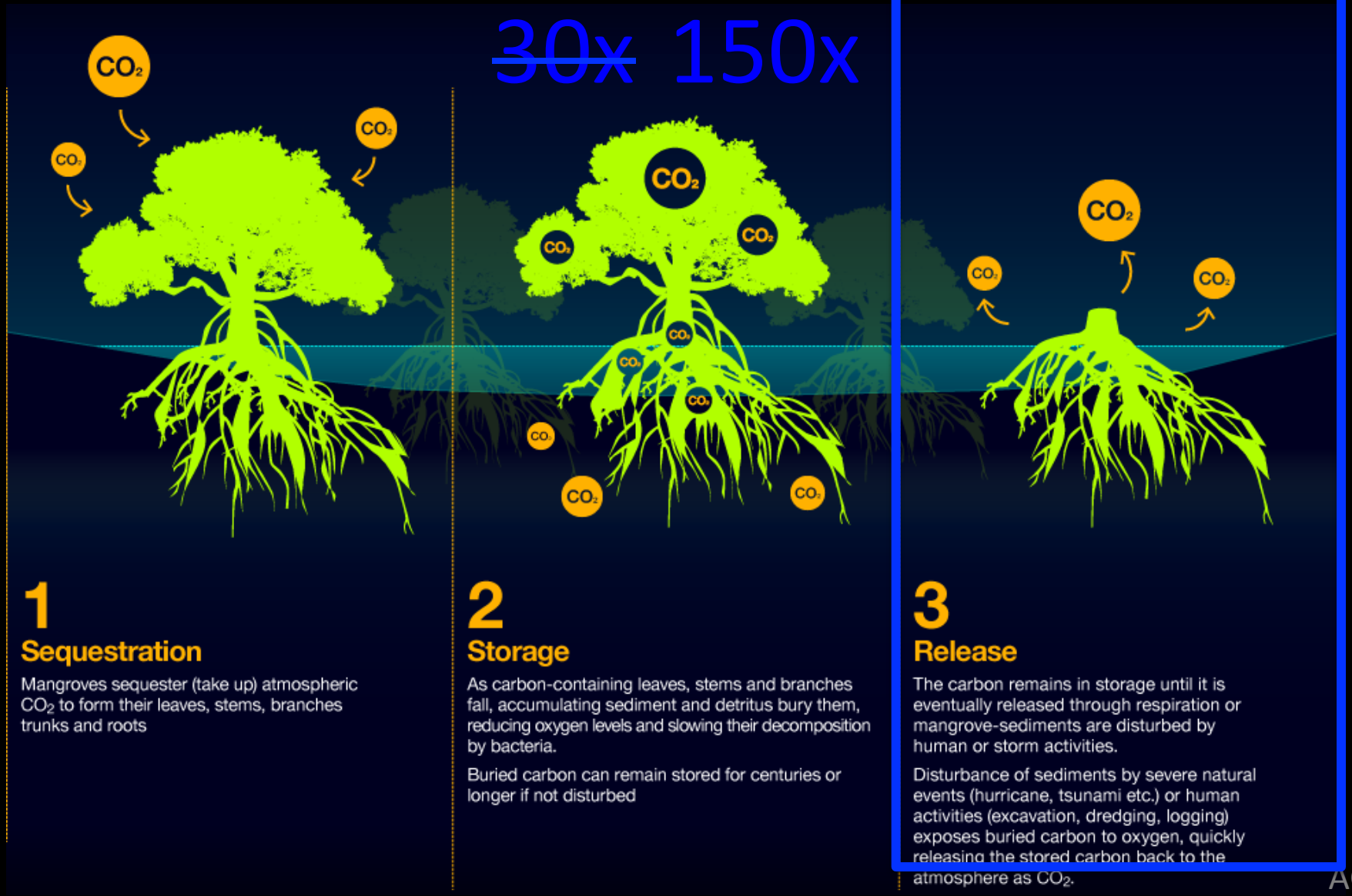

A Few Final Thoughts

- Annual carbon sequestration rates are much less than total carbon stored, yet we tend to only value carbon sequestration potential in decision-making
- Carbon storage in the soil is estimated to go to at least 1 meter in depth
- Need more studies on mangroves (and seagrasses) in the Gulf of Mexico


THANK YOU!
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