



# Sargassum moss

## Ecological aspects and source of influx

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**SARGASSUM SYMPOSIUM**

3Ws Pavilion, UWI, Cave Hill Campus

Monday, 17th August 2015, 8:30 a.m.





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# Sargassum moss

- What is it?
- What is its ecological significance?
- Where is it usually found?
- What is happening here?
- What about the future?

# Sargassum moss: what is it?

- A brown seaweed (moss)
- Found throughout the world
- Many different species
- Most are attached to bottom in shallow areas



# Sargassum moss: what is it?

- Attached species can form quite large sargassum beds
- Have gas-filled berries to keep the fronds upright
- Can survive afloat after being ripped up by wave energy



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# Sargassum moss: what is it?

- Two sargassum species are never attached
- They live as free-floating weed
- They can form large floating mats or long windrows of weed
- Common names include:
  - Sargassum seaweed
  - Gulf weed
  - Sea holly



*Sargassum natans*

*Sargassum fluitans*

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# Sargassum moss: Ecological significance?

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- Supports ocean food webs



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- Supports ocean food webs
- Provides essential shelter and forage for:
  - 10 endemic species
  - Young of many commercially important species
  - Young of several endangered species



Caroline Bissada



Amy Cox

# Sargassum moss: Ecological significance?

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- Supports ocean food webs
- Provides essential shelter and forage for:
  - 10 endemic species
  - Young of many commercially important species
  - Young of several endangered species
- Provides important breeding grounds



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Kyle Harris

# Sargassum moss:

## Ecological significance?

- Even in shallow water it has value:
  - Provides new forage
  - Shelter and camouflage



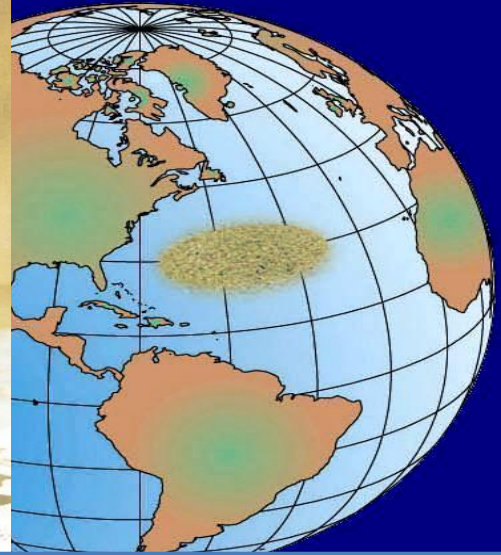
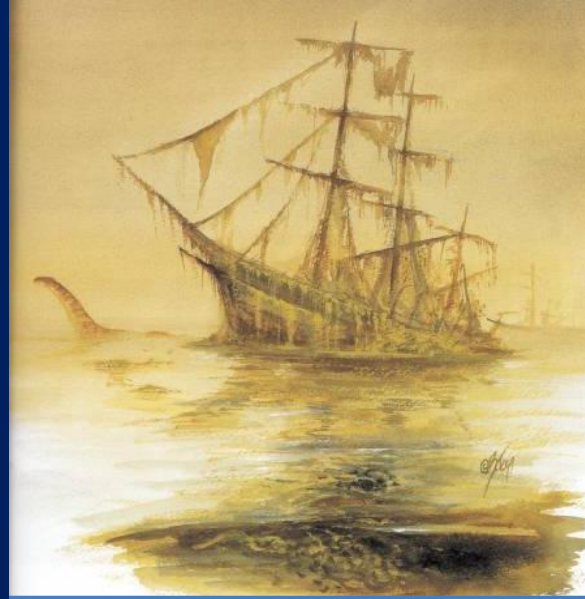
# Sargassum moss: Ecological significance?

- On shore it also has value:
  - For feeding shore birds
  - Binding sand and dunes
  - Fertilizing shore plants

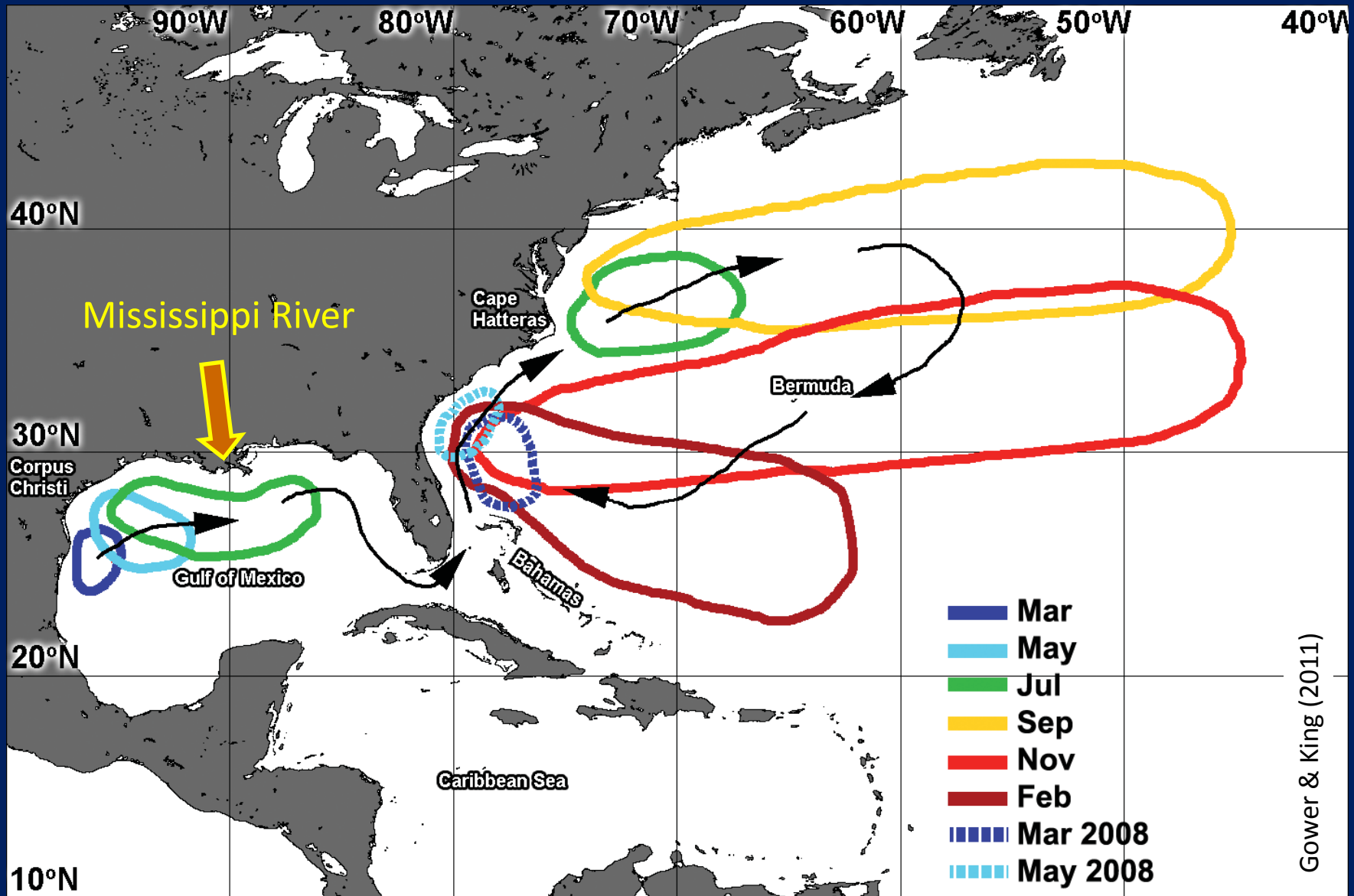


# Sargassum moss: where is it usually found?

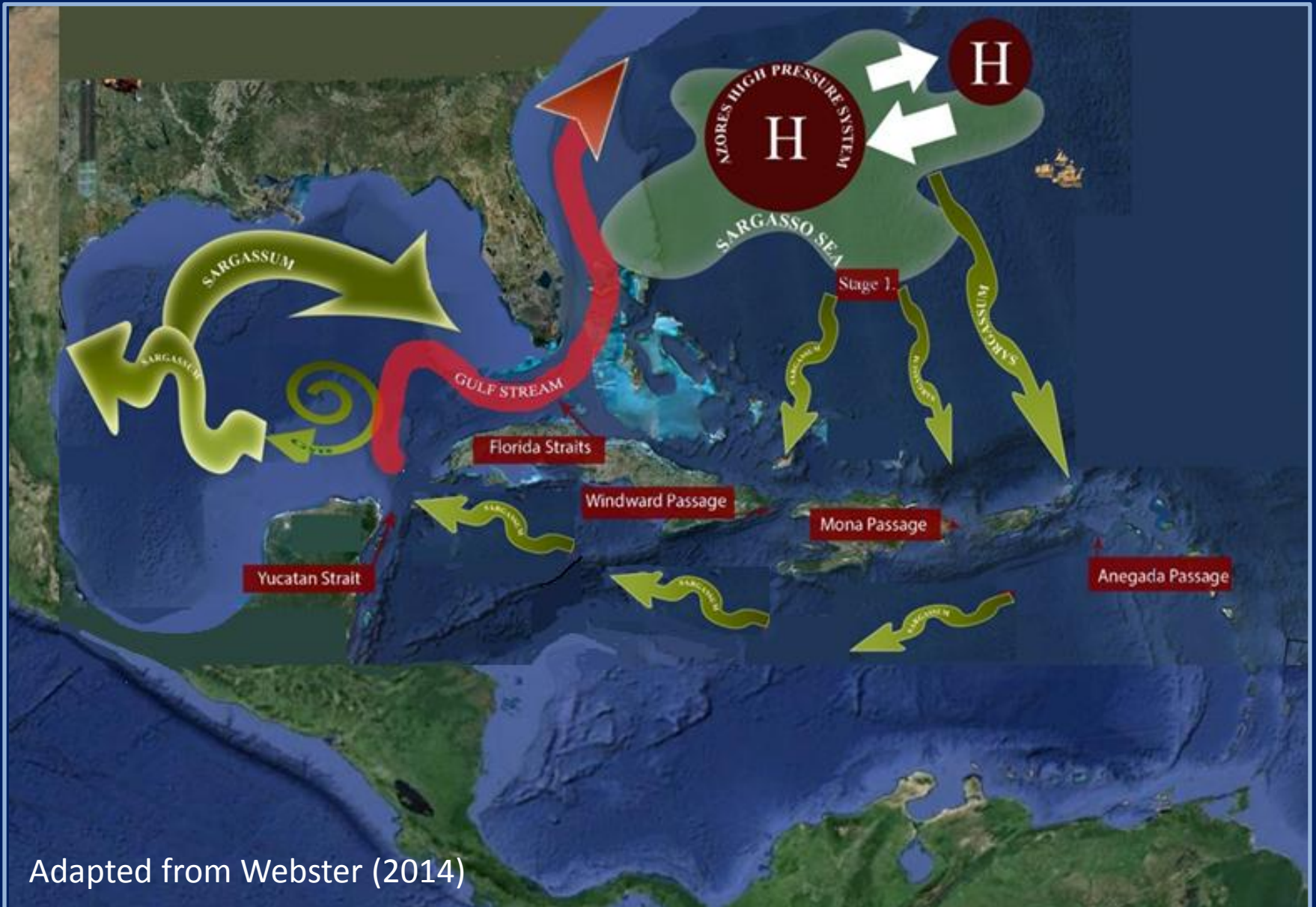
- Sargasso Sea –in the centre of the North Atlantic Ocean gyre
- Area about the size of USA
- Early sailors vexed by light winds and great mats of seaweed impeding progress
- Also known to occur in the Gulf of Mexico



# Sargassum moss: where is it usually found?

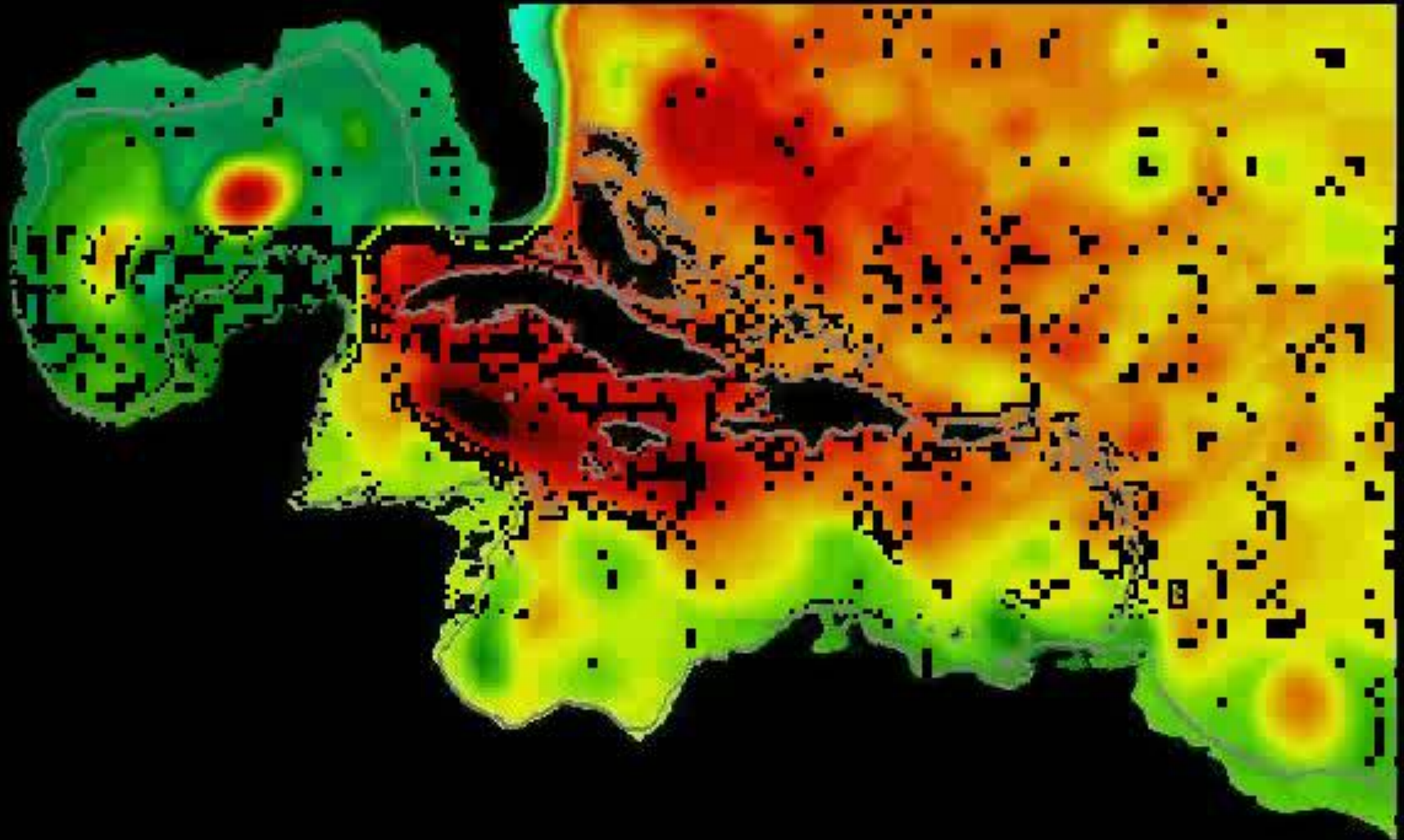


# Sargassum moss: where is it usually found?



Adapted from Webster (2014)

# Typical variations in current speed



MICOM model

# Sargassum moss: What is happening here?

Mass influxes have been occurring in the eastern Caribbean since 2011



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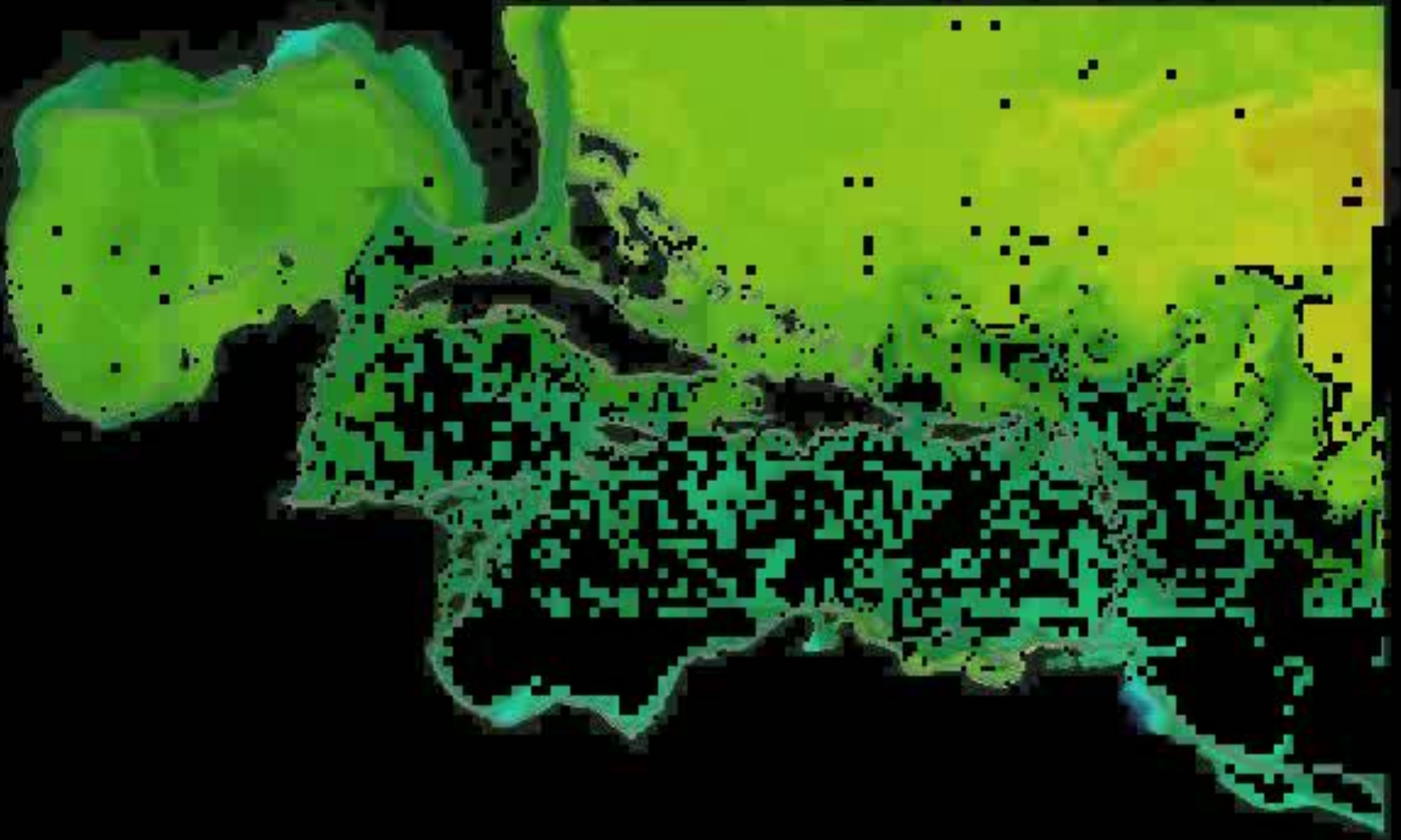


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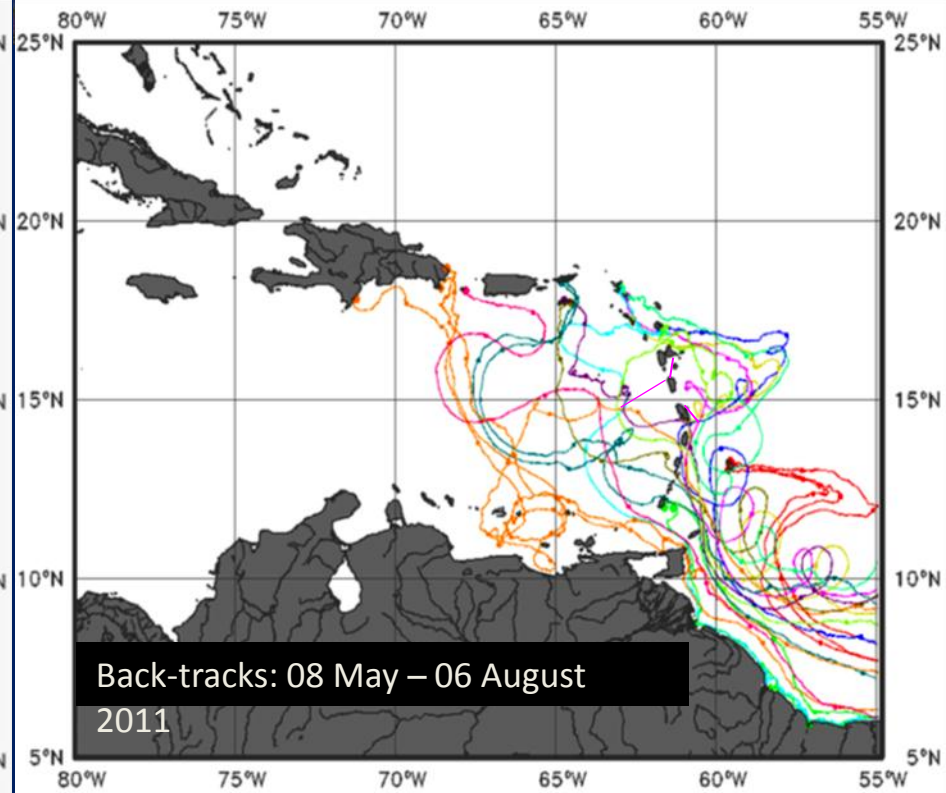
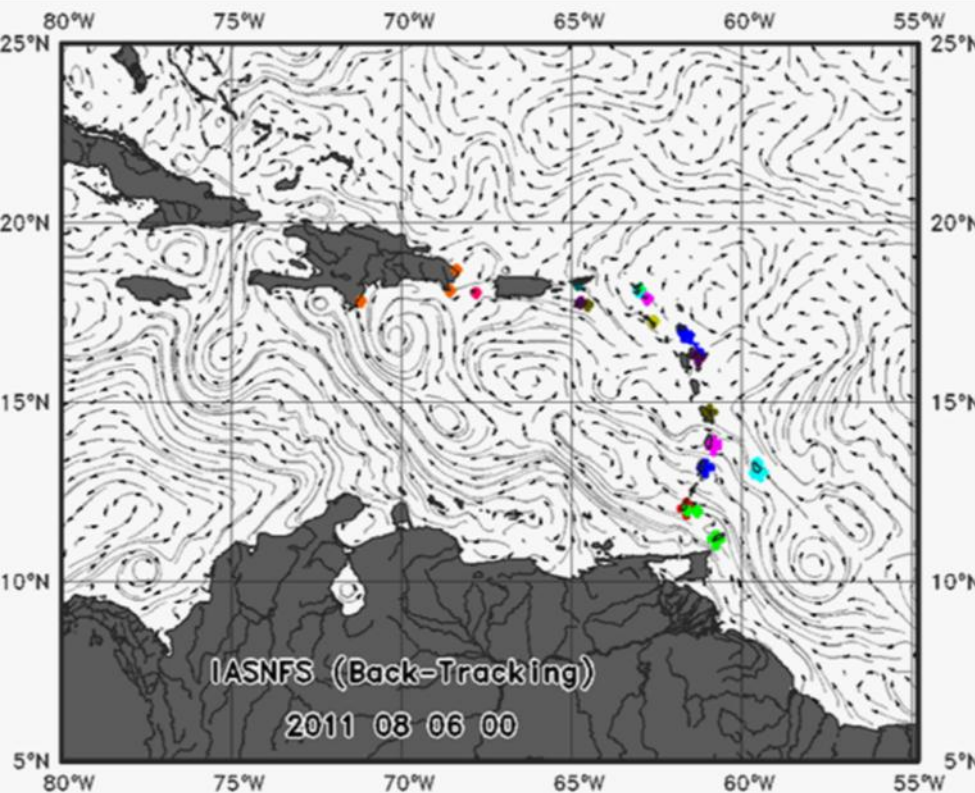
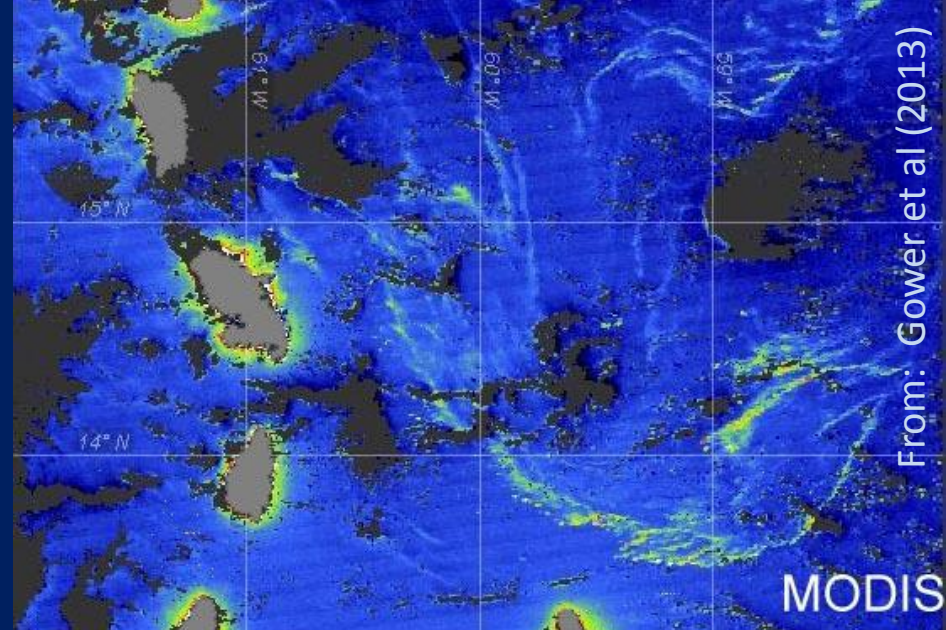
# Typical variations in salinity



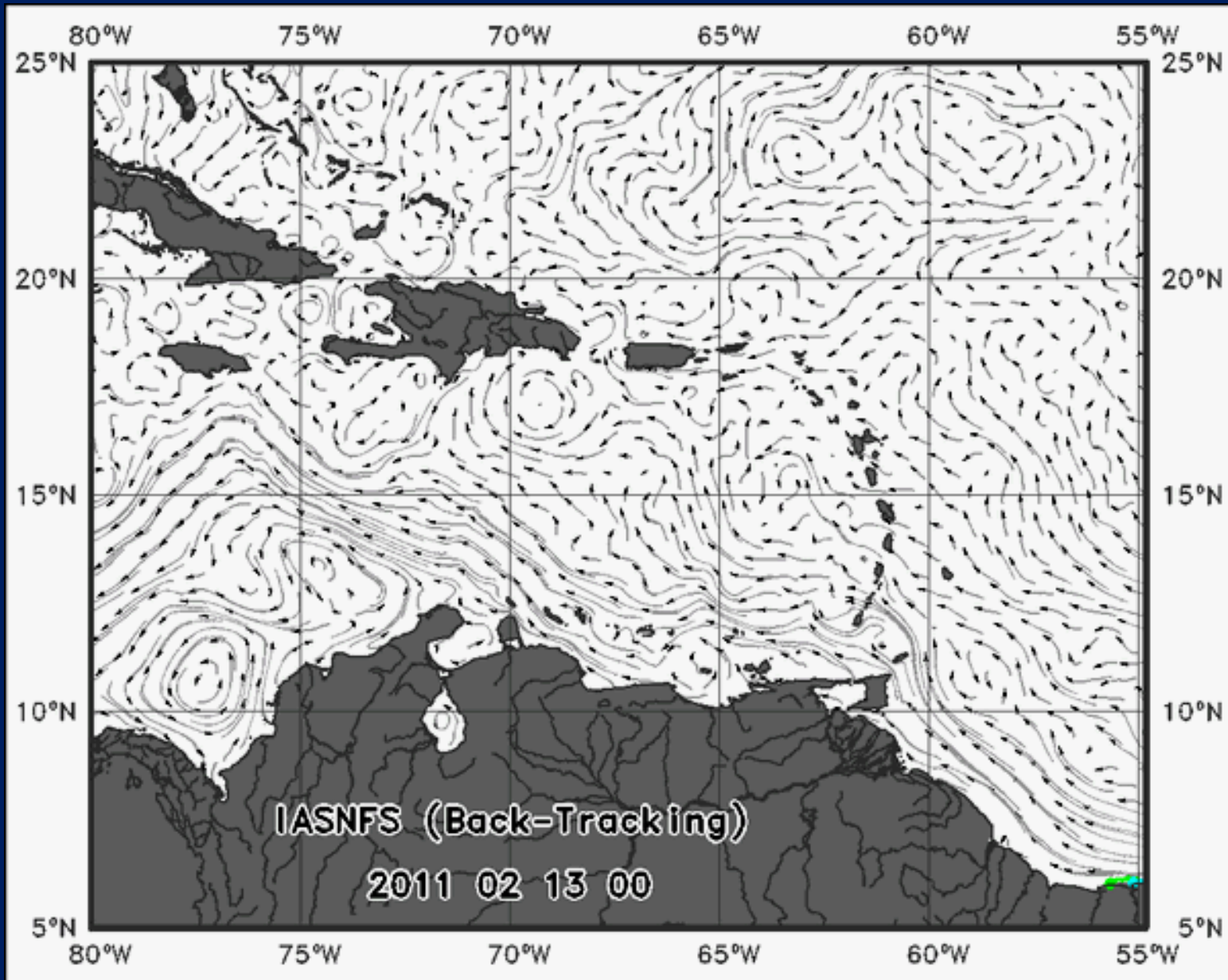
MICOM model

# Sargassum moss: What is happening here?

- Satellite imagery
- Surface currents

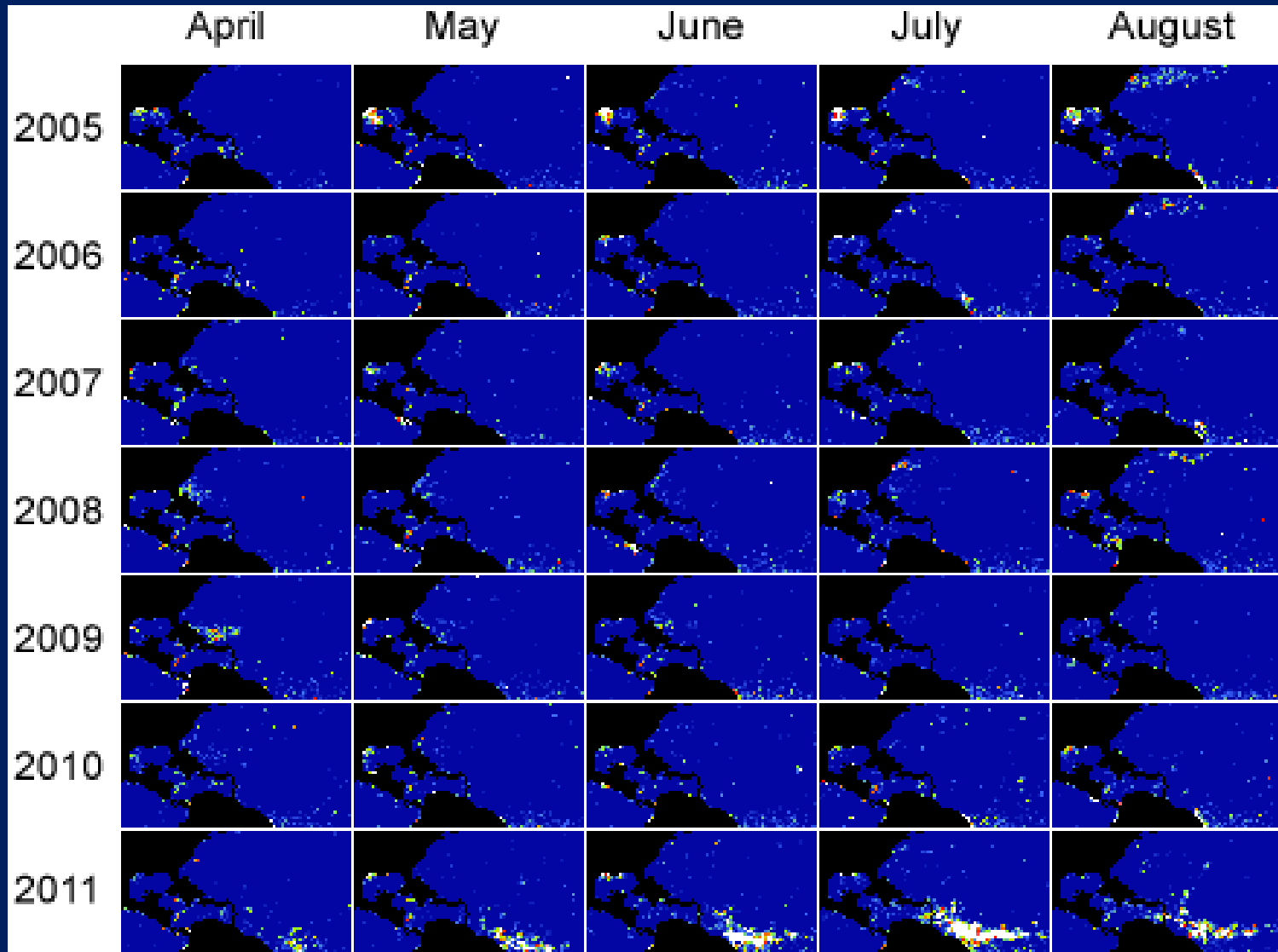


# Coming into the region from the southeast



13 February - 18 August 2011

# Originating from a new source along the equator



From: Gower et al (2013)

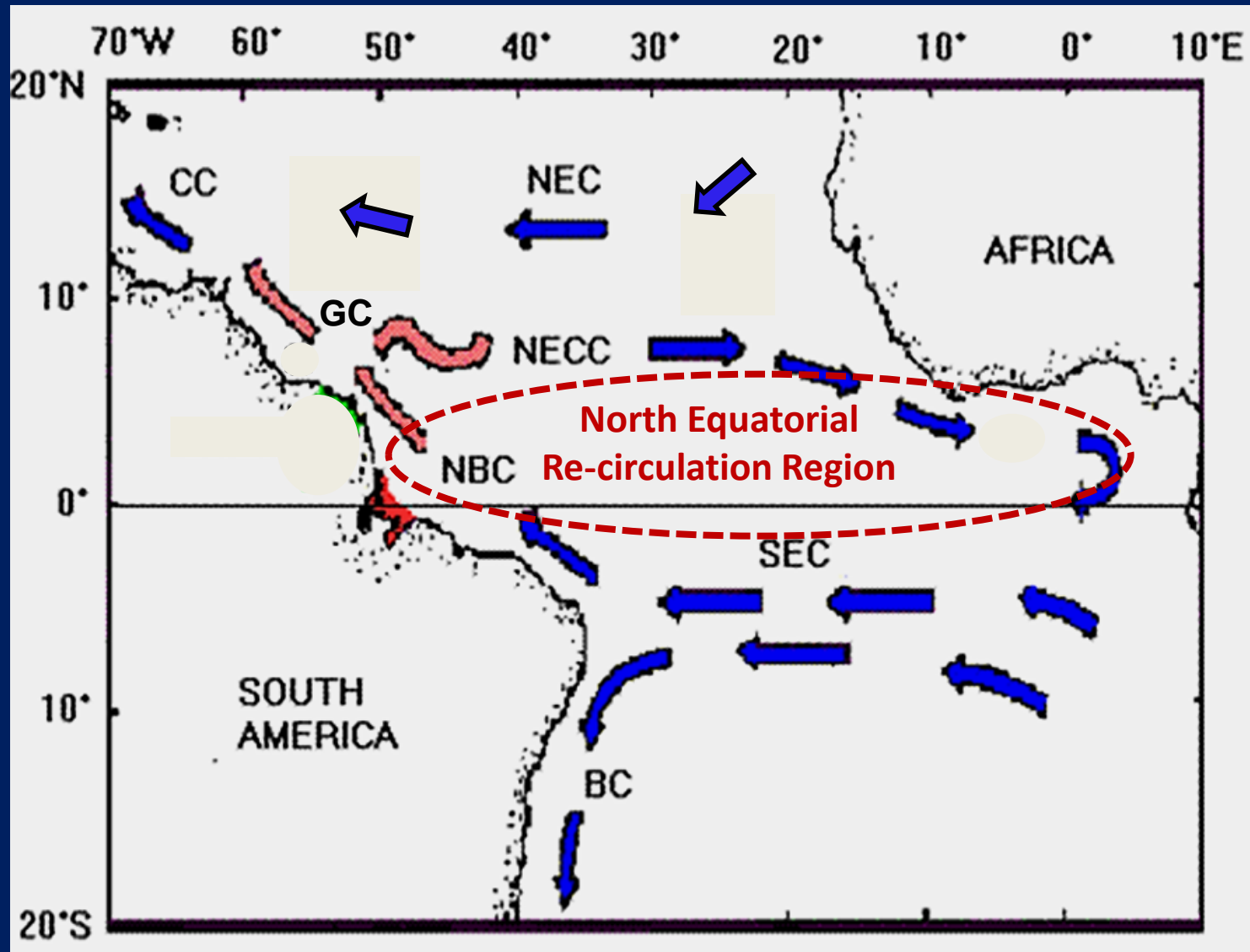
# Sargassum moss: What is happening here?

Same thing has been  
happening in west  
coast of Africa

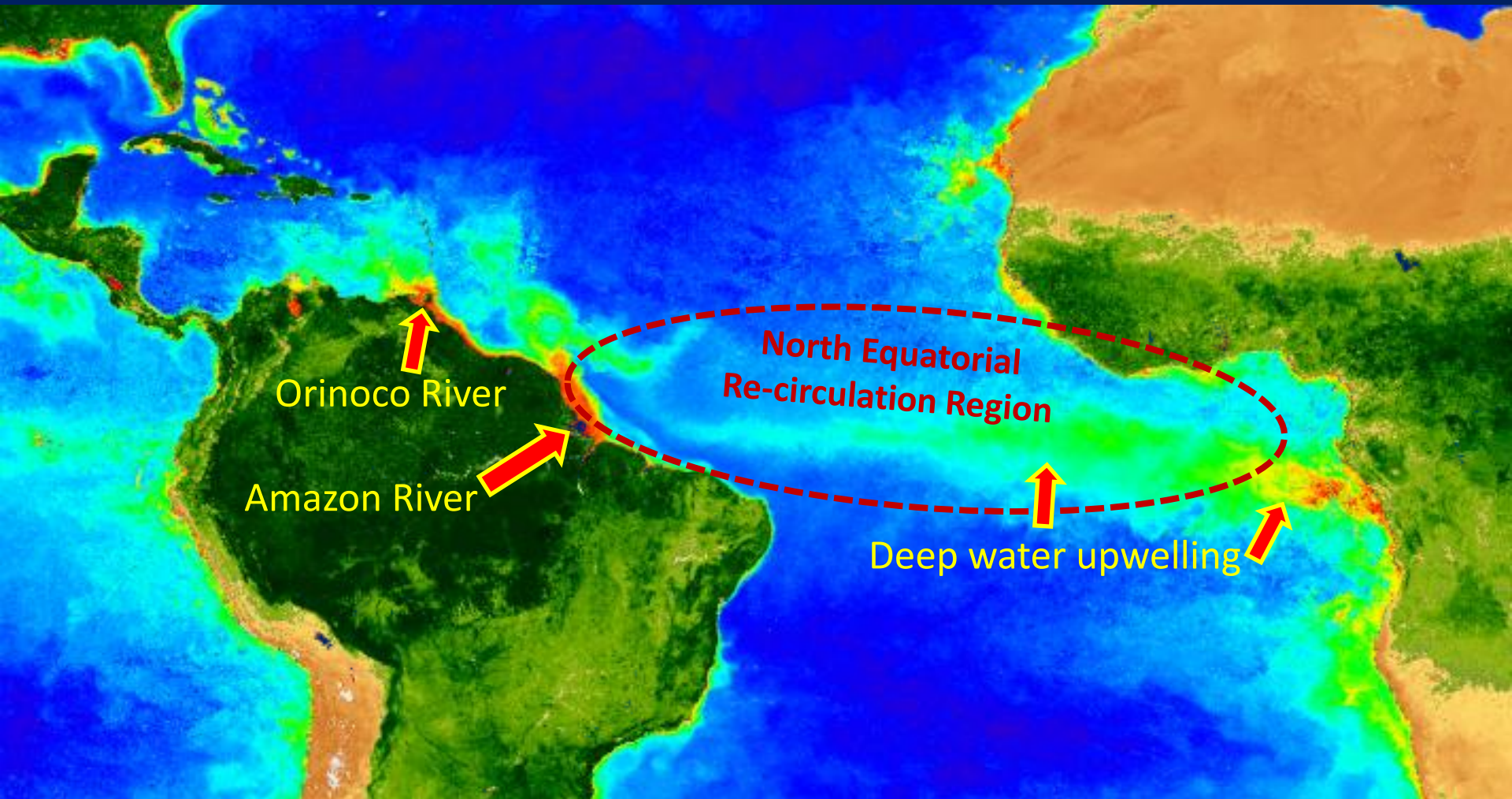
500 km shoreline affected



Equator is an area of complex circulating currents called the North Equatorial Re-circulation Region (NERR)



# Sources of nutrients in North Equatorial Re-circulation Region (NERR)



Orinoco River

Amazon River

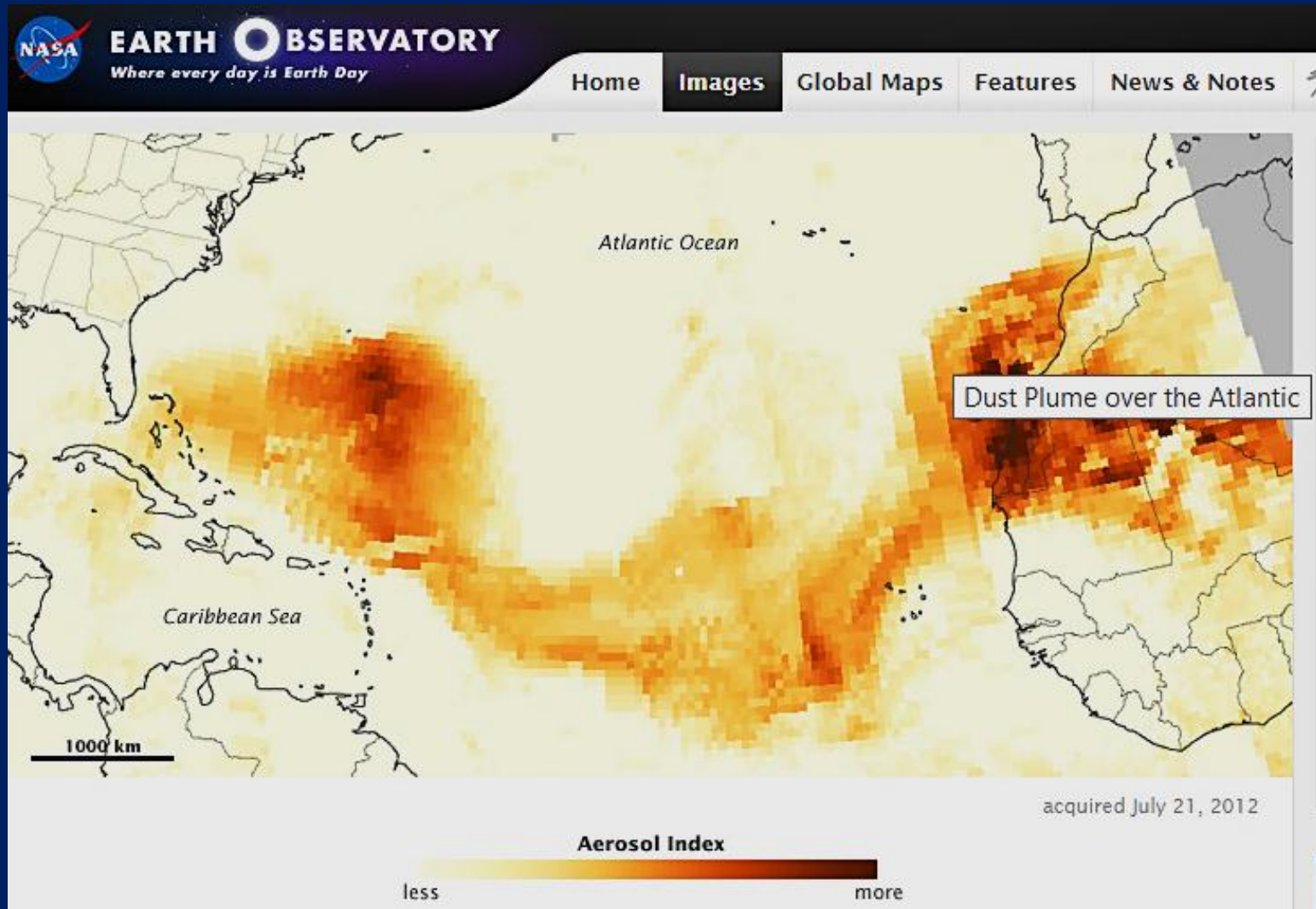
North Equatorial  
Re-circulation Region

Deep water upwelling

Chlorophyll *a* concentration (mg / m<sup>3</sup>)

0.01 0.03 0.1 0.3 1 3 10 30 60

# Sources of nutrients in North Equatorial Re-circulation Region (NERR)



# Sargassum moss:

## What about the future?

### So far we know:

- Sargassum in the open ocean creates a valuable ecosystem
- Sargassum landfalls are not new
- The sargassum 'bloom' affecting us now, did NOT occur in the Sargasso Sea or the Gulf of Mexico.
- The NERR is the source of our sargassum.

### ... and we don't know:

- What caused all the favourable environmental conditions to occur together
- Whether climate change is a significant driving force
- Whether this phenomenon will continue

### On-going research:

- Attempting to predict the future occurrences of sargassum here by
  - Examining patterns in North & Equatorial Atlantic climate indices
  - Using drifters and current models to examine and predict surface currents
- Understanding the impacts on fish resources

### .. need for collaboration

# Reference sources:

- Franks et al 2011.** Unprecedented influx of pelagic *Sargassum* along Caribbean Island coastlines during summer 2011. Proc. Gulf Carib. Fish. Inst., 64:6-8
- Johnson et al 2012.** The *Sargassum* invasion of the Eastern Caribbean and dynamics of the equatorial north Atlantic. Proc. Gulf Carib. Fish. Inst., 65:102-103
- Franks et al 2014.** Retention and growth of pelagic *Sargassum* in the North Equatorial Recirculation Region (NERR) of the Atlantic Ocean. Proc. 67<sup>th</sup> Gulf Carib. Fish. Inst., Christ Church, Barbados
- Frazier 2014.** Advanced prediction of the Intra-Americas sargassum season through analysis of the Sargassum Loop System using remote sensing technology. MSc thesis, Texas A&MU
- Gower & King 2011.** Distribution of floating Sargassum in the Gulf of Mexico and the Atlantic Ocean mapped using MERIS. Int. J. Remote Sensing, 32: 1917-1929
- Gower et al 2013.** Satellite images suggest a new Sargassum source region in 2011. Remote Sensing Letters 4: 764-773



Amy Cox

## Thanks to:

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