A satellite-style map of the Caribbean region, showing the Gulf of Mexico, the Caribbean Sea, and the surrounding landmasses of North and South America. The water is dark blue, and the land is green and brown. The text is overlaid on the right side of the map.

# SOCAR Report: Computational analysis & Socio-economic Context

*L. Talaue McManus  
LBS STAC Informal Workshop for SOCAR  
Panama City, 17 July 2018*

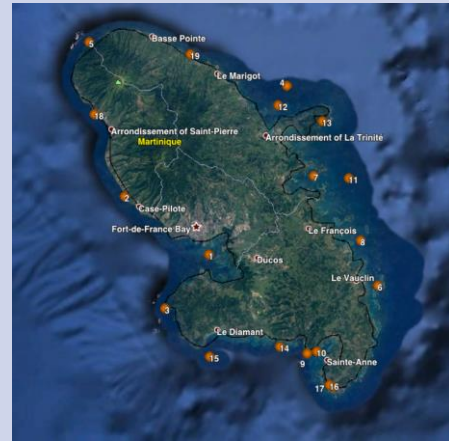
Raw country data file

Sampling Sites  
Mapped; Data sorted  
by season

Data Processing

Data Summaries,  
Checks & Visuals

Site Name	Lat	Long	State/Province	Season	Year	Day	Month	Parameter 1	Parameter 2	Parameter 3	Parameter 4	Parameter 5



Time coverage: 2010-2015

**Continental countries & big islands:**

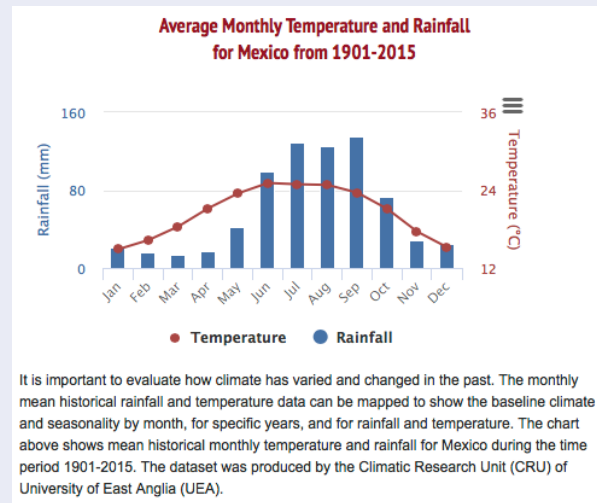
Season > State > Sampling sites > Raw data



\*Ave weighted by state/province coastline length derived using GIS (Cathalac)

1. Summarized data
2. Evaluated data using standards & cut-off values at sampling site/ state scale

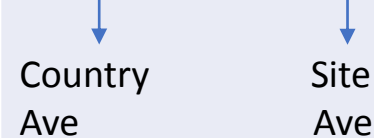
- Removing text strings, noting units, measurement limits, geo-references, etc
- Data rearranged to sorting format
- Data tagged by SEASON
- Data tagged by PROVINCE/STATE for continental countries and islands > 700 km<sup>2</sup>



Source: World Bank; Caribbean Regional Climate Centre

**Small islands:**

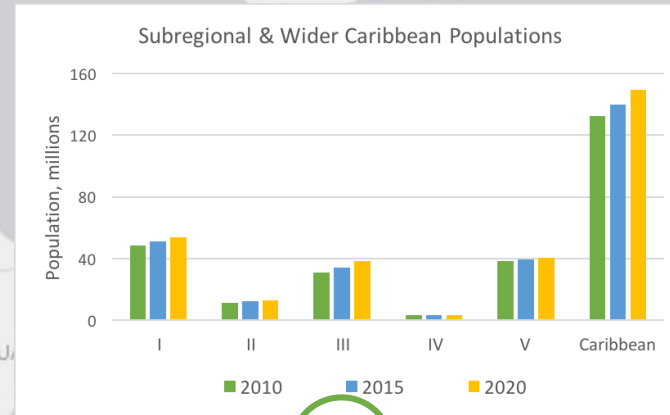
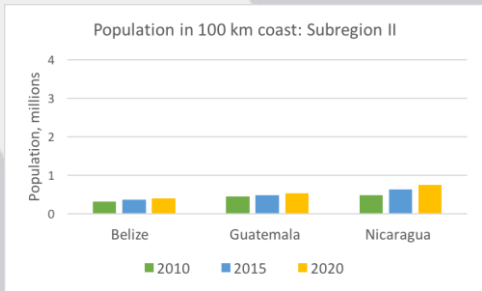
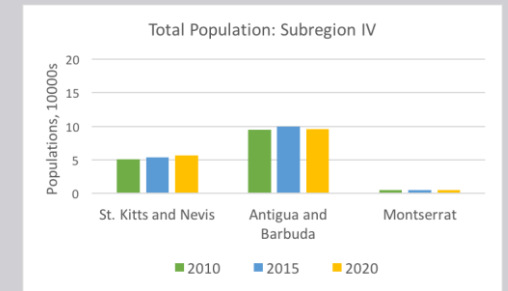
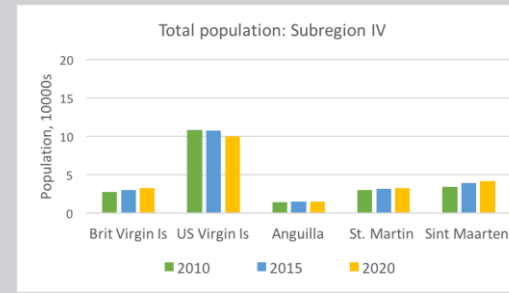
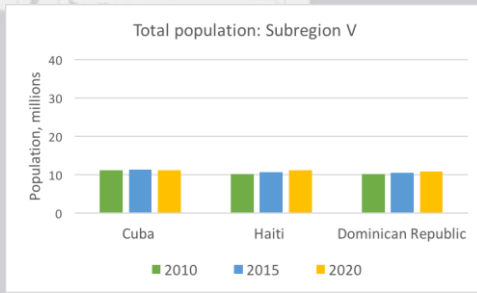
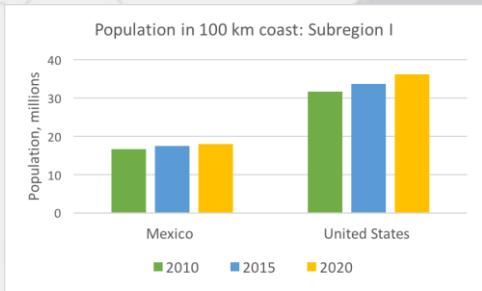
Season > Sampling sites > Raw data



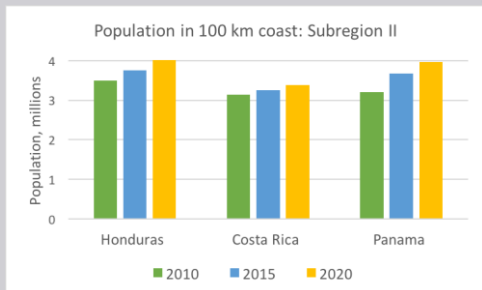
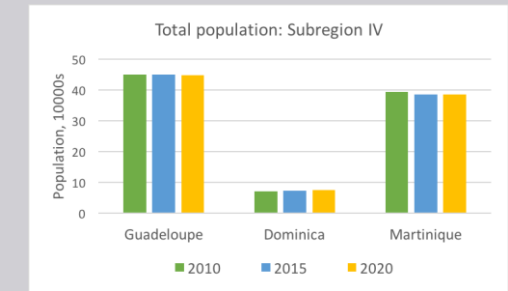
3. Data visualization

# Socio-economic parameters and data sources

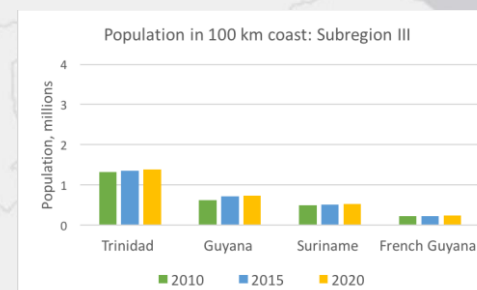
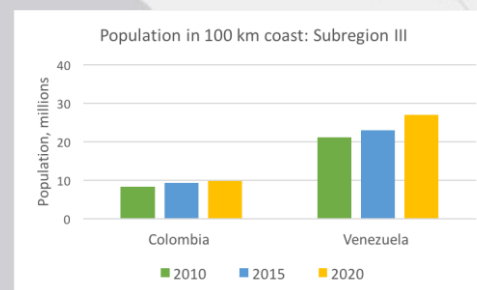
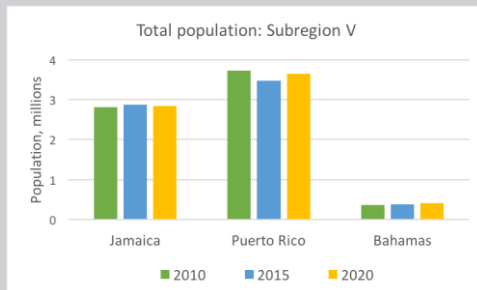
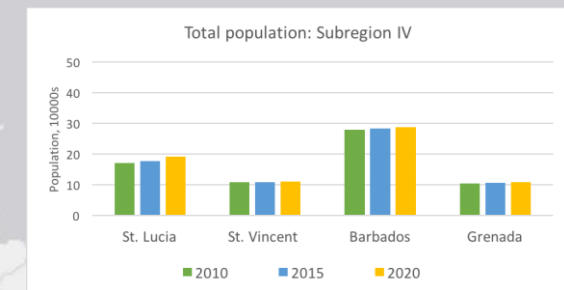
Parameters	Global Sources	Remarks
Upstream coastal population (100 km from coast in continental states and the large islands, and the total population of SIDS)	Socioeconomic Data and Applications Center, Center for Int'l Earth Science Information Network , Columbia Univ.	Country scale tabular data for 2000, 2010, 2015
% with and without connection to sewer systems	UNICEF	Country data for 1990 and 2015
Incidence of water related illnesses per year	Global Health Data Exchange	User specifies filters for data at country scale by gender/age
Incidence of fish kills and red tides per year	IOC-UNESCO Harmful Algal Information System (Int'l Oceanographic Data and Information Exchange); NOAA (e.g. HABSOS Gulf of Mexico)	
% GDP tourism	World Travel and Tourism Council	Country scale tourism data by year
% GDP agriculture	FAO	Country scale agriculture data by year
Ocean Health Index (OHI)	OHI website / data downloads	EEZ scale OHI including Goal and Sub-Goal Score
Cumulative Human Impact (CHI)	CHI website / data downloads	EEZ scale CHI Score and impact scores by stressor and CHI

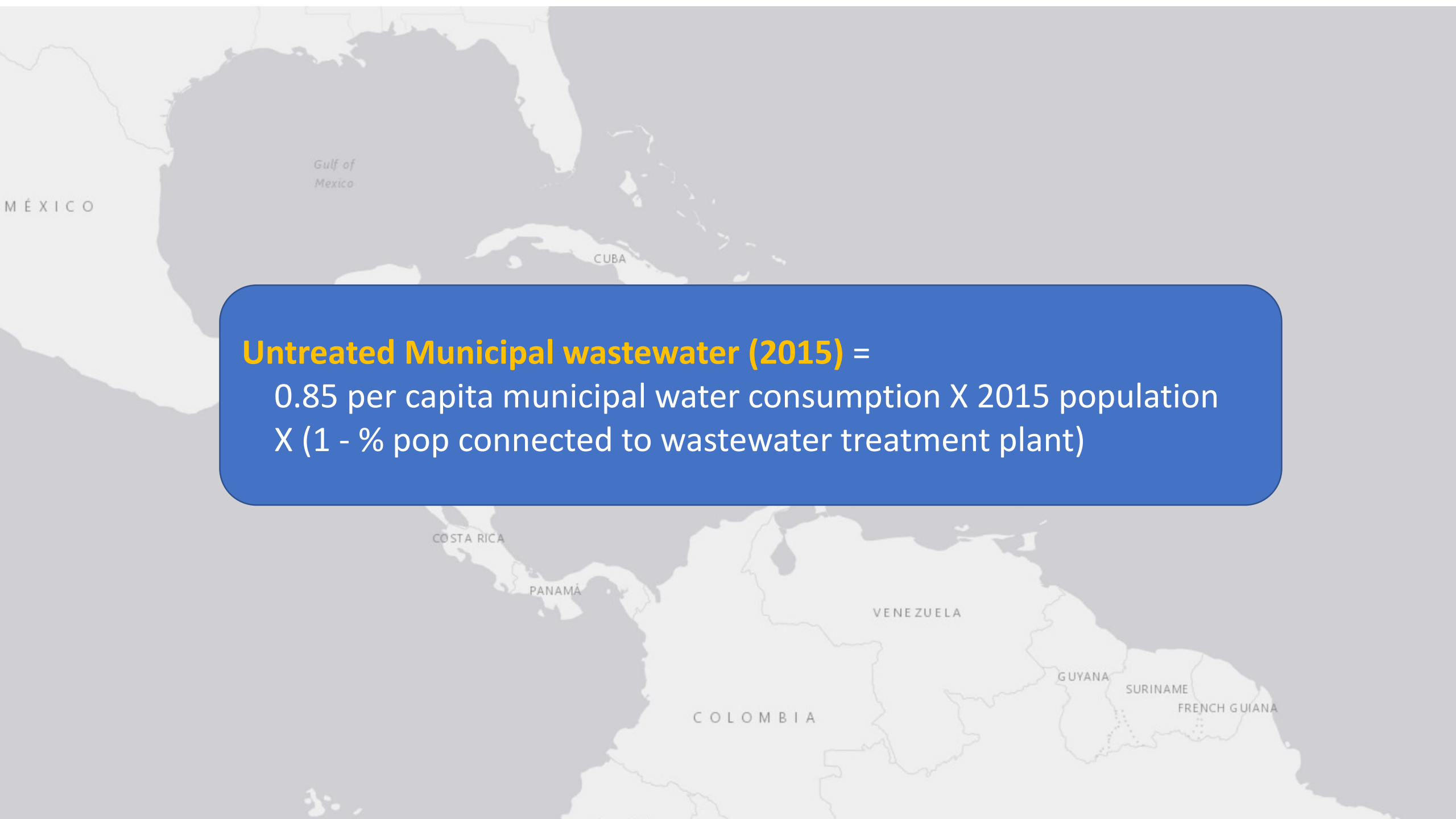


140 M  
(ave)



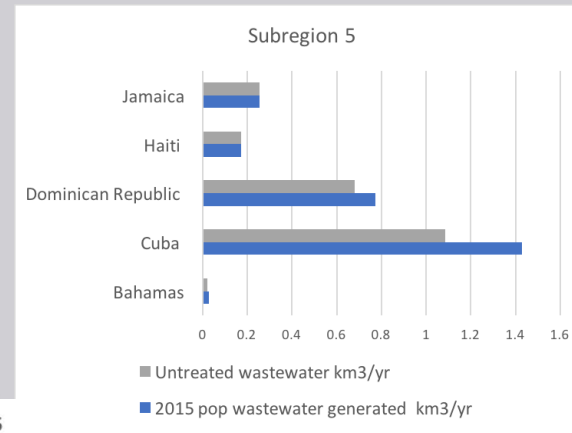
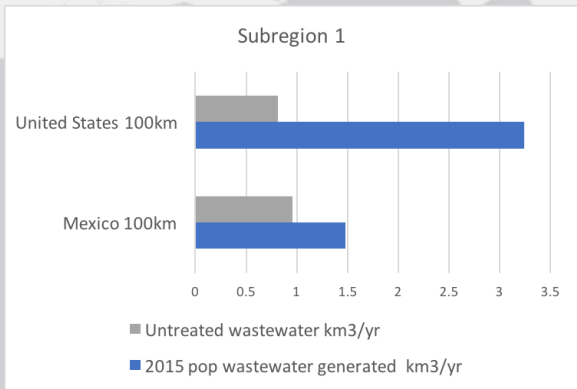
36% 9% **25%** 2% 28%



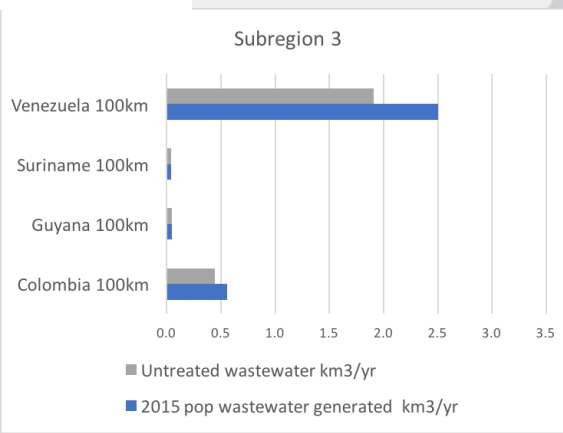
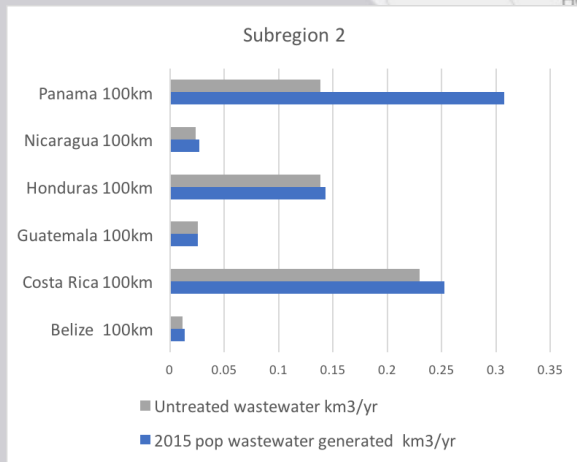
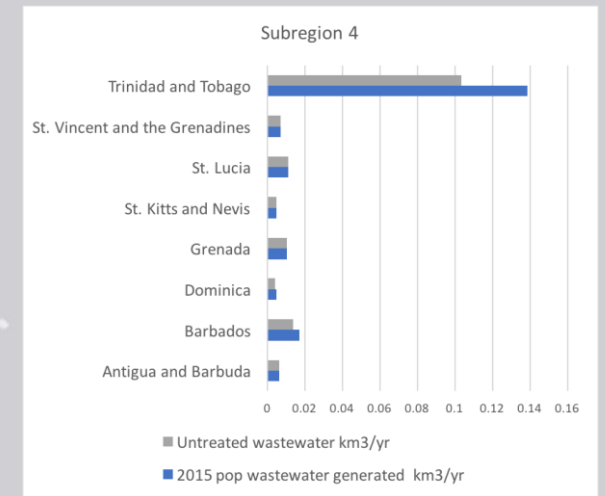
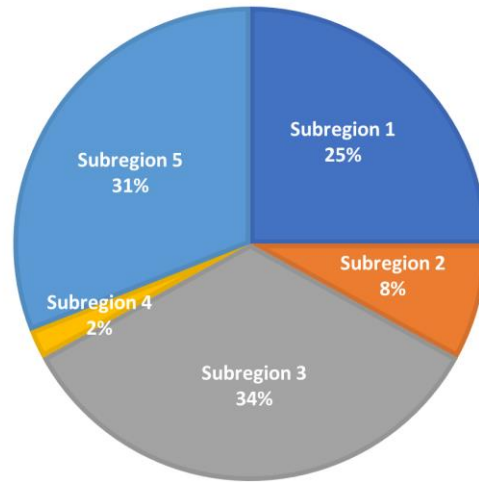


**Untreated Municipal wastewater (2015) =**

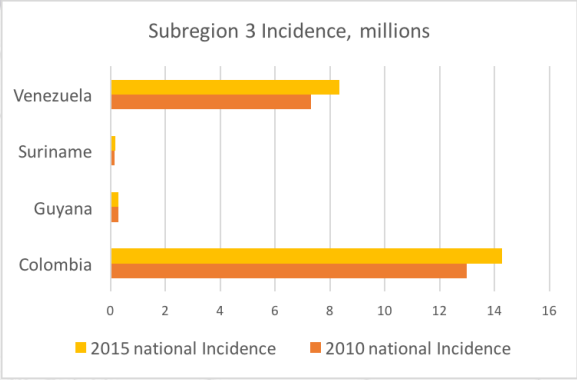
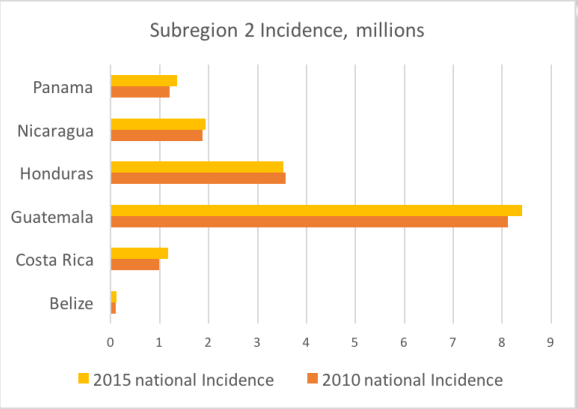
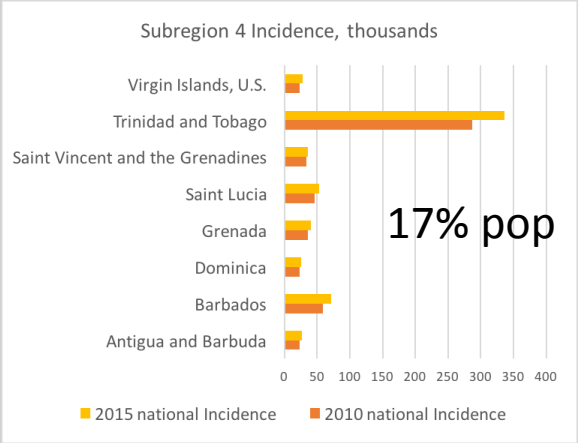
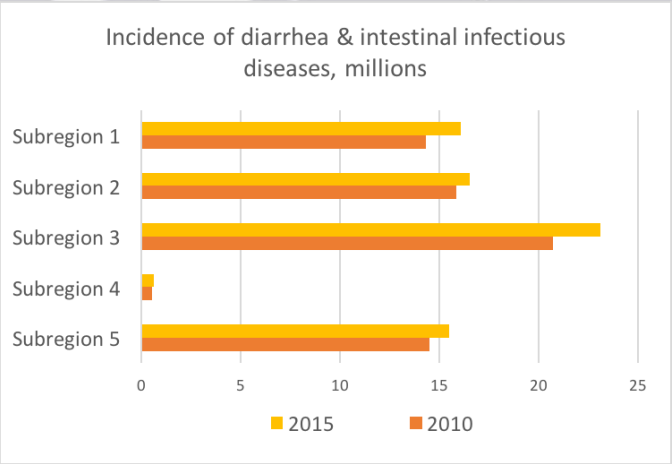
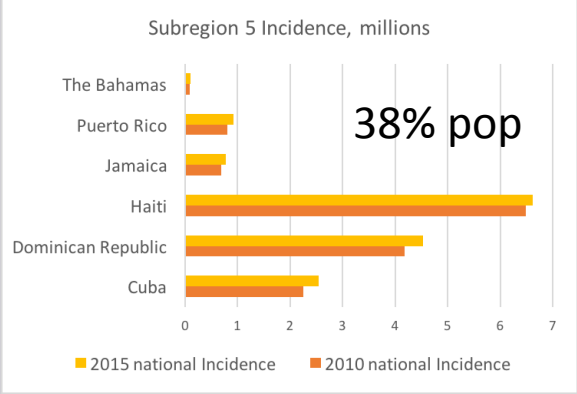
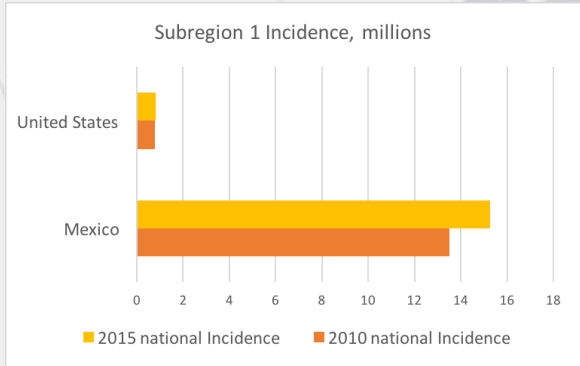
0.85 per capita municipal water consumption X 2015 population  
X (1 - % pop connected to wastewater treatment plant)



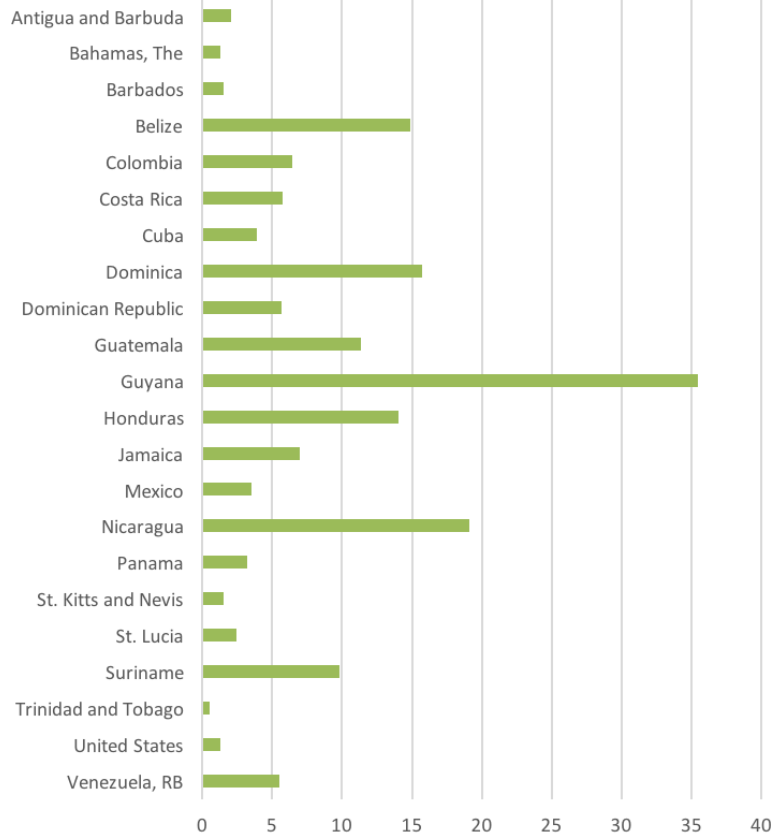
UNTREATED WASTEWATER: 7 KM<sup>3</sup> IN 2015



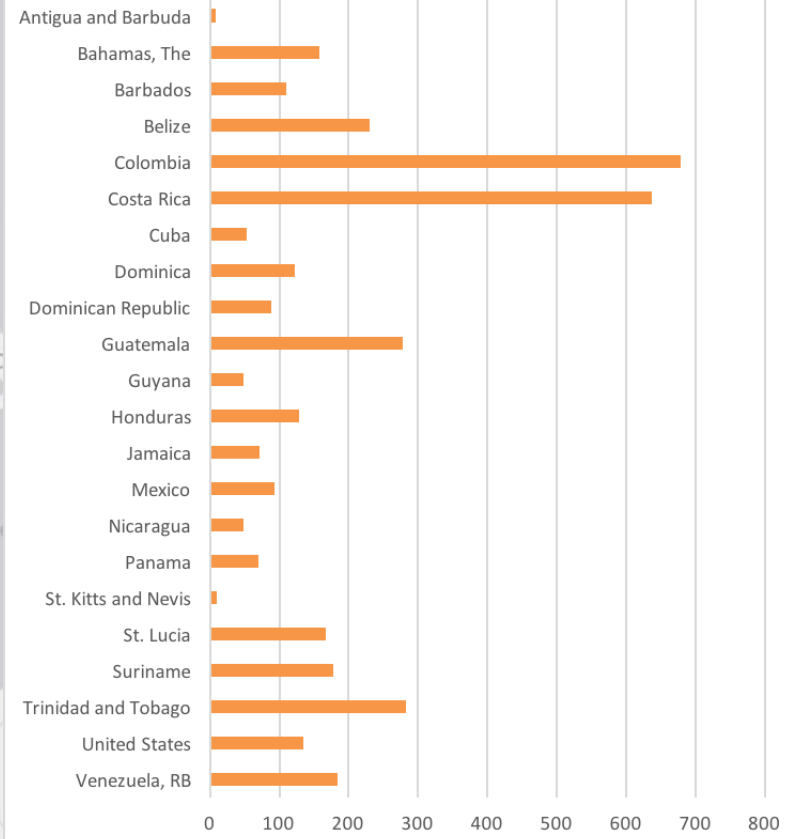
Untreated wastewater = 62% generated



Average % GDP from Agriculture, 2011-2015



Average fertilizer consumption, 2011-2015



MÉXICO

Caribbean Sea

VENEZUELA

COLOMBIA

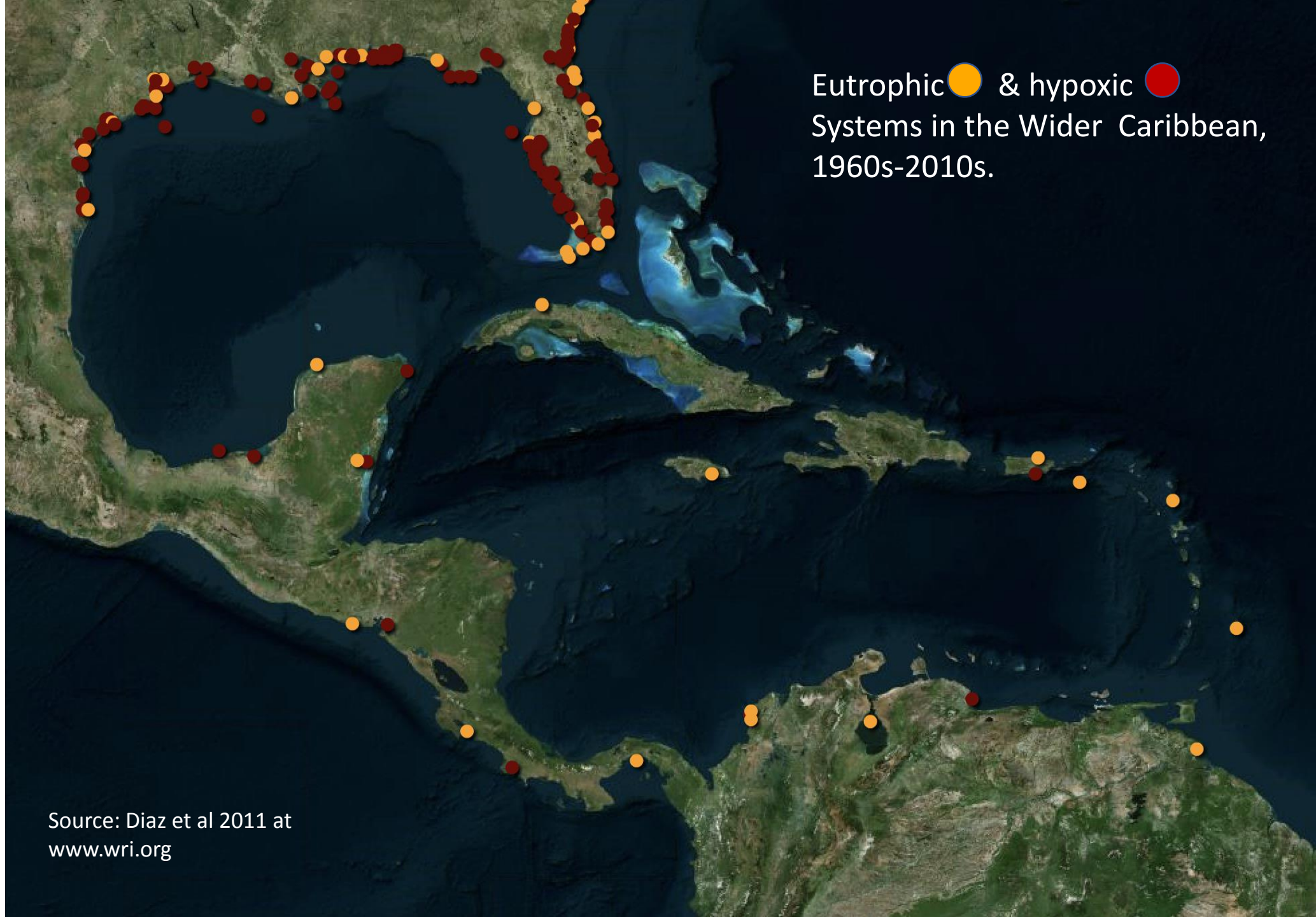
GUYANA

SURINAME

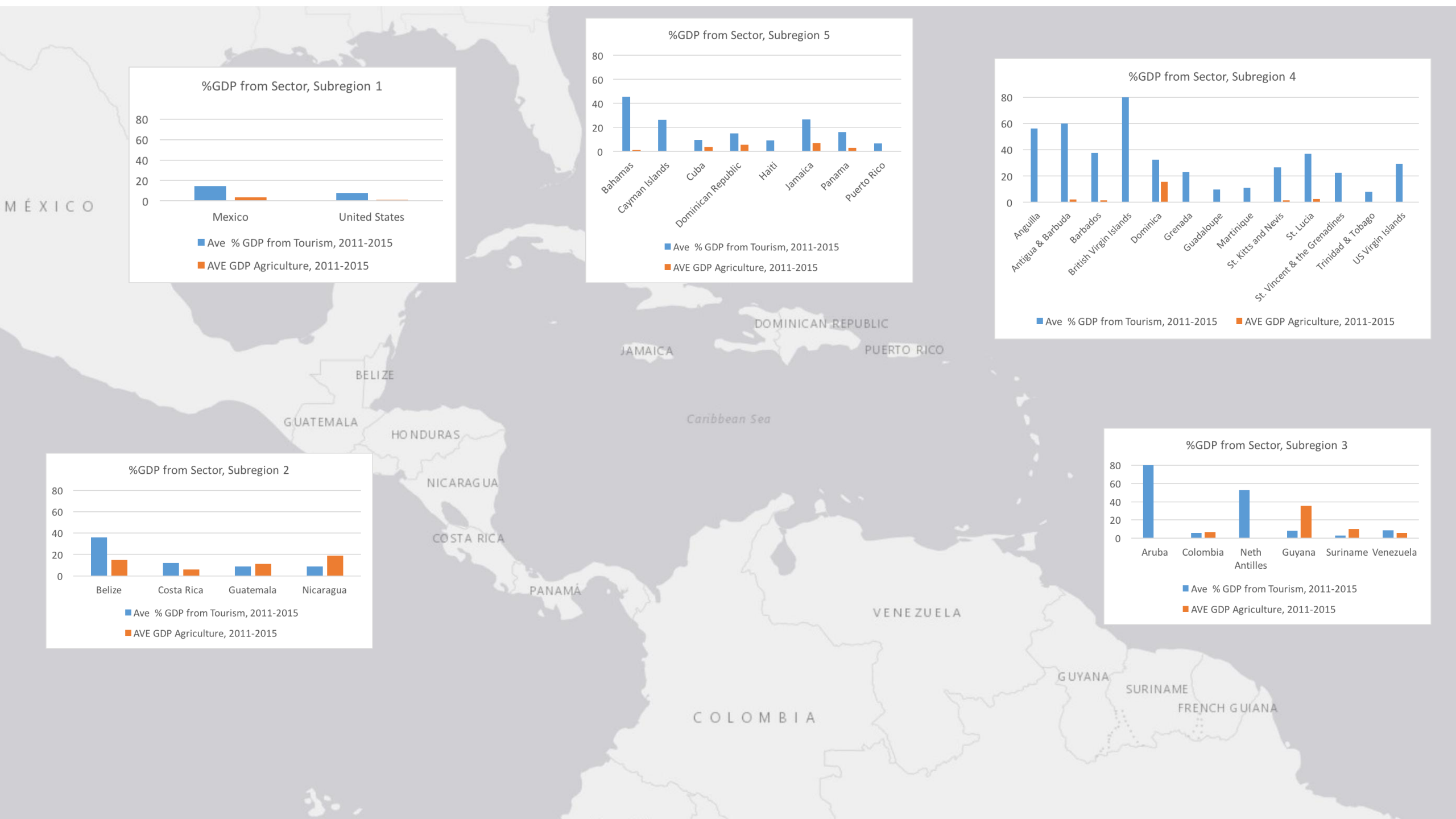
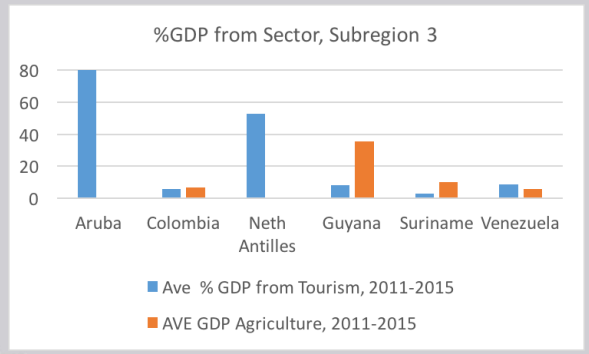
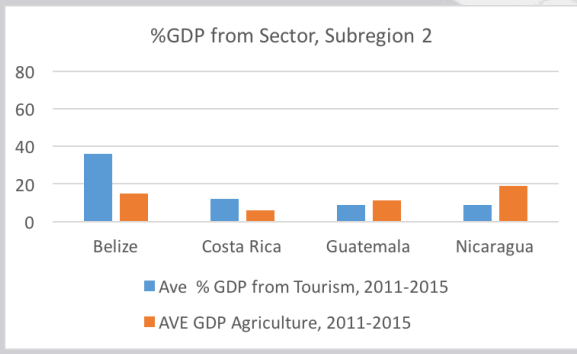
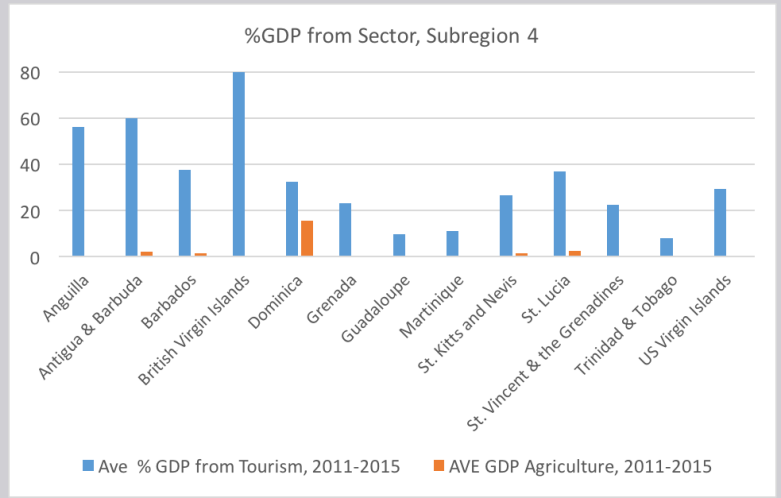
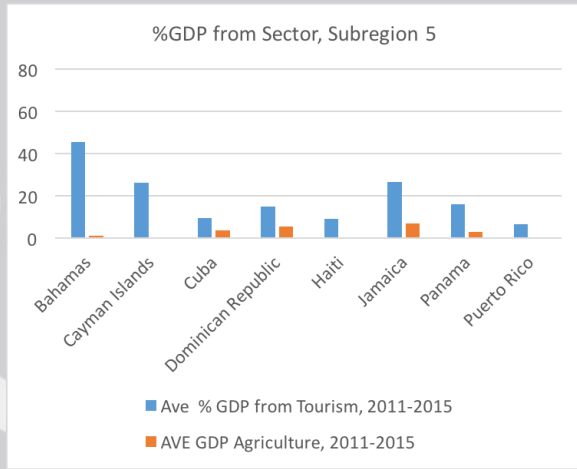
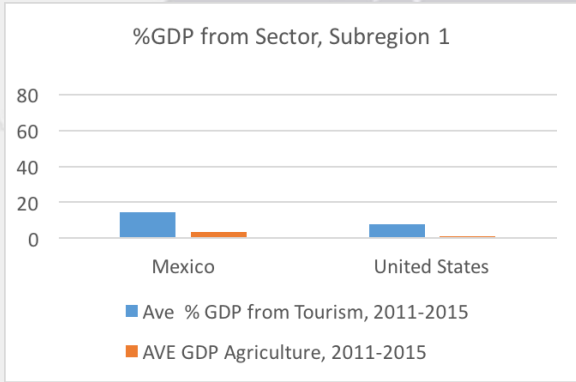
FRENCH GUIANA

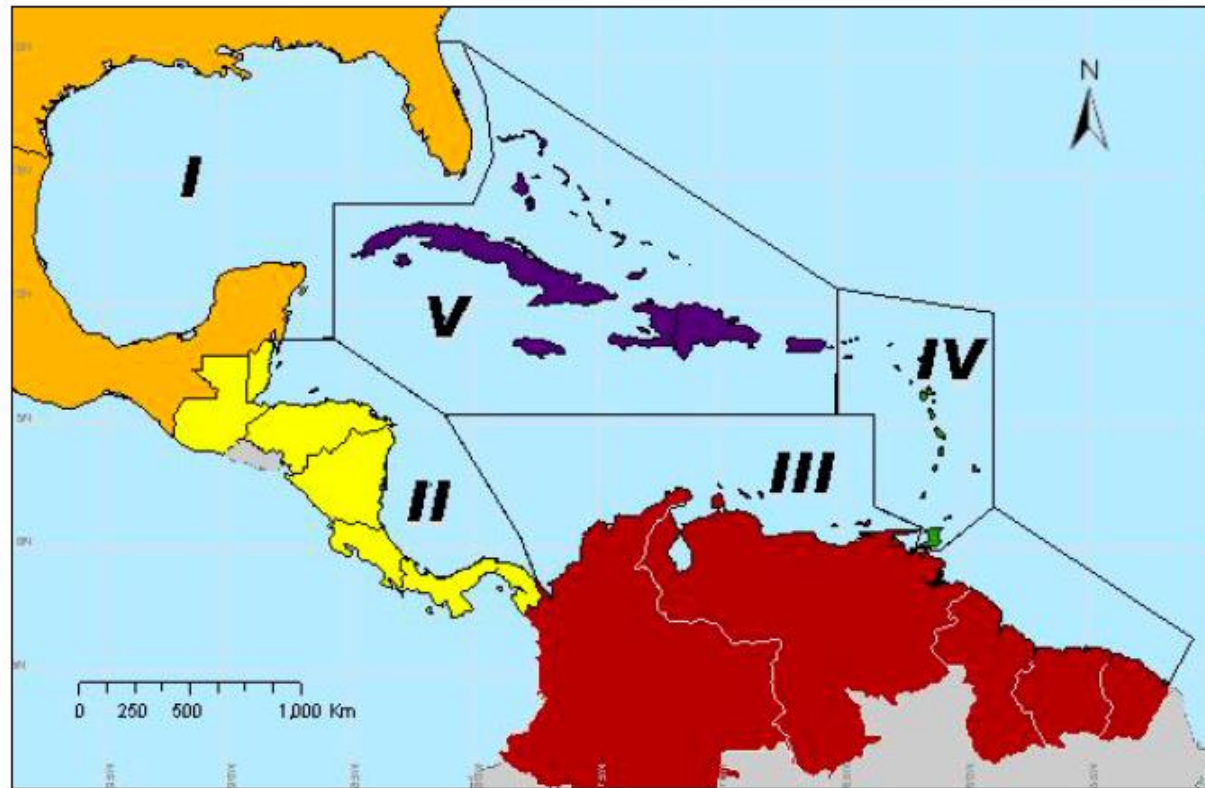


Eutrophic ● & hypoxic ●  
Systems in the Wider Caribbean,  
1960s-2010s.



Source: Diaz et al 2011 at  
[www.wri.org](http://www.wri.org)





**Figure 2. Division of the WCR into 5 sub-regions**

*Sub-region I Gulf of Mexico;* includes the United States of America and Mexico.

*Sub-region II Western Caribbean;* includes the countries of Central America with coastlines on the Caribbean Sea: Belize, Guatemala, Honduras, Nicaragua, Costa Rica and Panama.

*Sub-region III Southern Caribbean;* includes the countries of the South American continent: Colombia, Venezuela, Guyana, French Guiana, Suriname, Aruba and the Netherlands Antilles.

*Sub-region IV Eastern Caribbean;* includes the islands Anguilla, Antigua and Barbuda, Barbados, British Virgin Islands, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, St. Martin, St. Lucia, St. Bartholomi, St. Kitts and Nevis, St. Vincent and the Grenadines, U.S. Virgin Islands and Trinidad & Tobago.

*Sub-region V North-eastern and Central Caribbean;* includes Bahamas, Cayman Islands, Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico and the Turks and Caicos Islands.