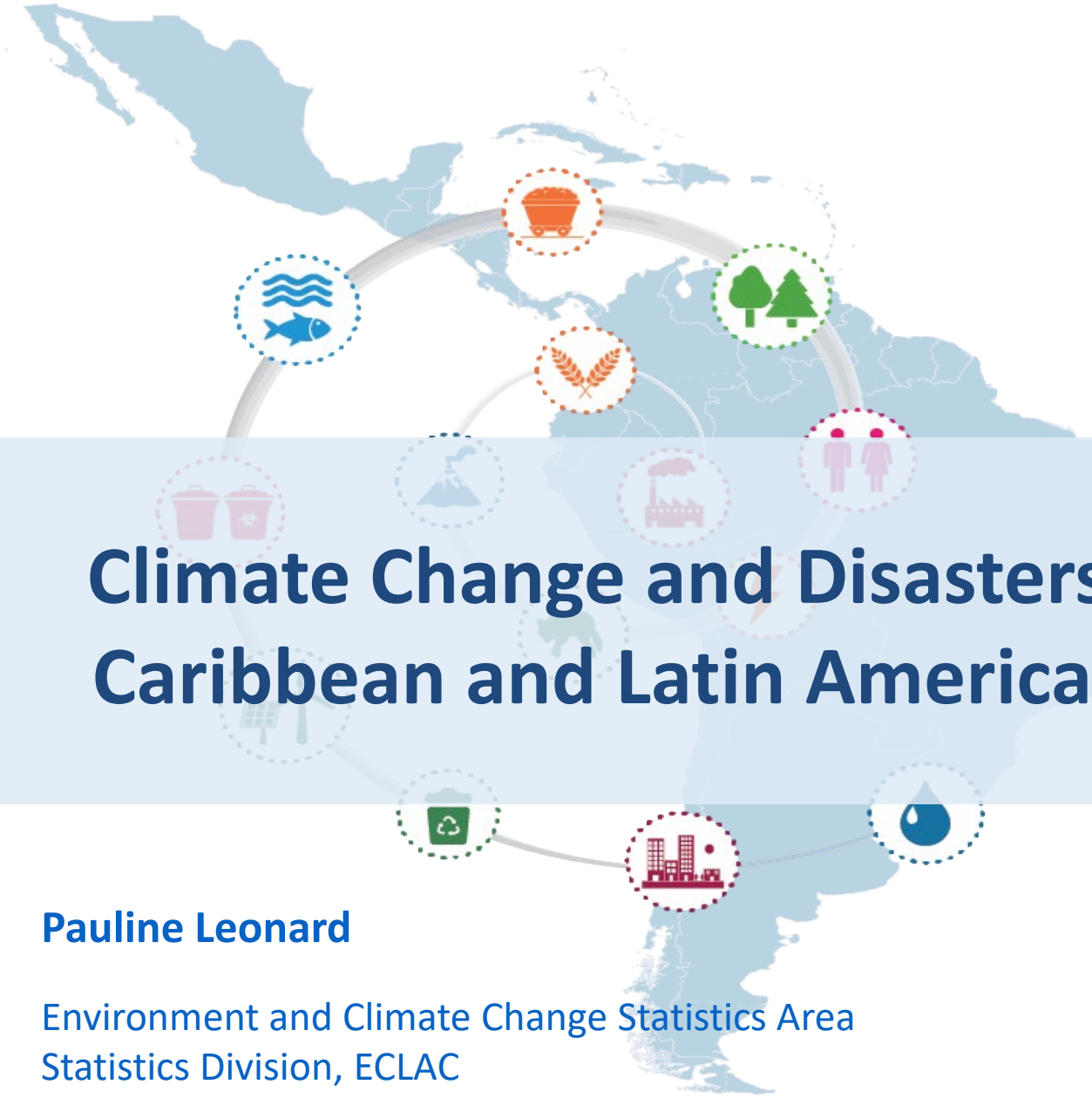

Regional Workshop on
Environment and Climate
Change Statistics
8 November 2019, Grenada

Climate Change and Disasters Indicators: A Caribbean and Latin American perspective

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Environment and Climate Change Statistics Area
Statistics Division, ECLAC

UNITED NATIONS

ECLAC

Climate change statistics in the FDES

IPCC framework

Source: Intergovernmental Panel on Climate Change

Climate Process Drivers	
Sub-component 1.3: Environmental Quality	**Sub-component 3.1: Emissions to Air**
1.3.1 Air quality	3.1.1 Emissions of greenhouse gases 3.1.2 Consumption of ozone depleting substances

Climate Change Evidence	
Sub-comp. 1.1: Physical Conditions	**Sub-comp. 4.1: Natural Extreme Events and Disasters**
1.1.1 Atmosphere, climate and weather 1.1.2 Hydrographical characteristics	4.1.1 Occurrence of natural extreme events and disasters

Climate Change Impacts and Vulnerability						
Sub-comp. 1.1: Physical Conditions	**Sub-comp. 1.2: Land Cover, Ecosystems and Biodiversity**	**Sub-comp. 1.3: Environmental Quality**	**Sub-comp. 2.3: Land**	**Sub-comp. 4.1: Natural Extreme Events and Disasters**	**Sub-comp. 5.1: Human Settlements**	**Sub-comp. 5.2: Environmental Health**
1.1.2 Hydrographical characteristics 1.1.4 Soil characteristics	1.2.1 Land cover 1.2.2 Ecosystems and biodiversity 1.2.3 Forests	1.3.3 Marine water quality	2.3.1 Land use	4.1.2 Impact of natural extreme events and disasters	5.1.3 Housing conditions	5.2.3 Vector-borne diseases 5.2.4 Health problems associated with excessive UV radiation exposure

Mitigation and Adaptation			
Sub-comp. 2.2: Energy Resources	**Sub-comp. 6.1: Environmental Protection and Resource Management Expenditure**	**Sub-comp. 6.2: Environmental Governance and Regulation**	**Sub-comp. 6.3: Extreme Ever Preparedness and Disaster Management**
2.2.2 Production, trade and consumption of energy	6.1.1 Government environmental protection and resource management expenditure 6.1.2 Corporate, non-profit institution and household environmental protection and resource management expenditure	6.2.2 Environmental regulation and instruments 6.2.3 Participation in MEAs and environmental conventions	6.3.1 Preparedness for natural extreme events and disasters

Outline: Climate change statistics and indicators

+
Available data

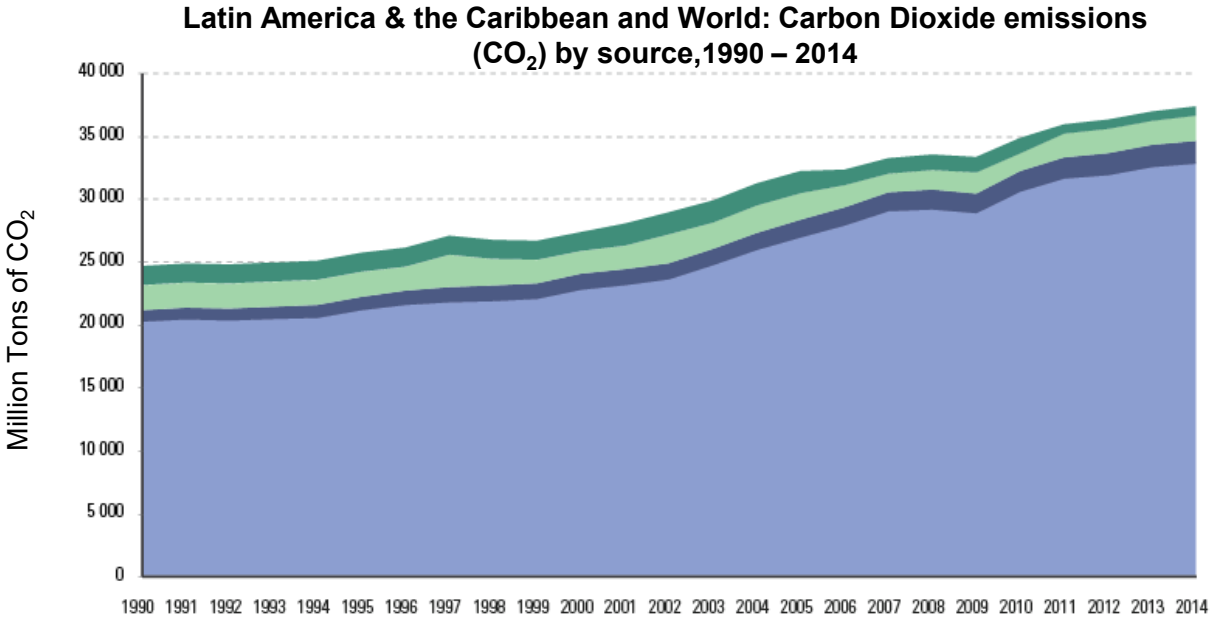
- Drivers: Concentrations (GEI)
- Emissions and mitigation efforts in LAC
- Evidence of CC in LAC, and impacts
  - Regional and global warming evidence
  - Evidence of higher frequency of disasters
  - Evidence of greater disaster impact
- Adaptation

-
Available data

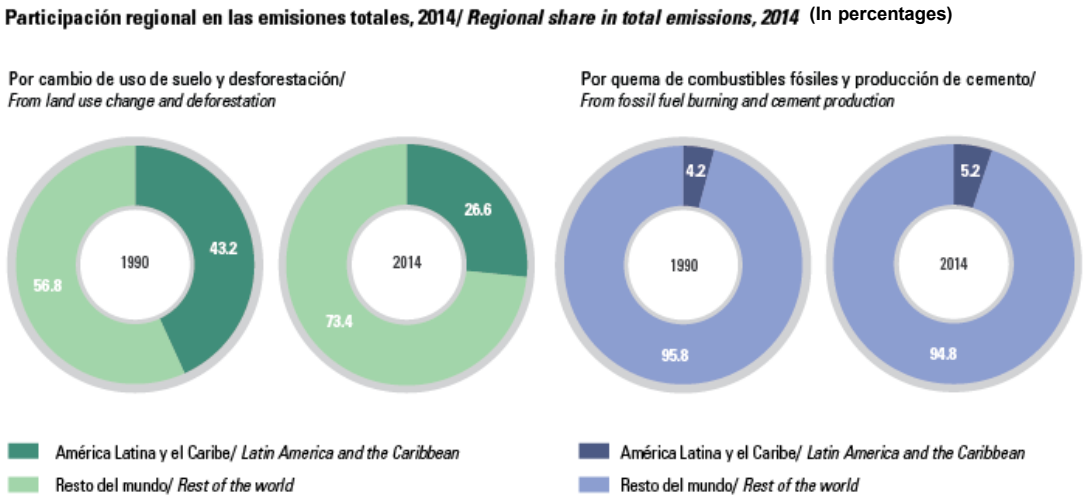
CC Drivers indicators: examples

Regional (LAC) Share in Total CO2 Emissions, 1990 - 2014

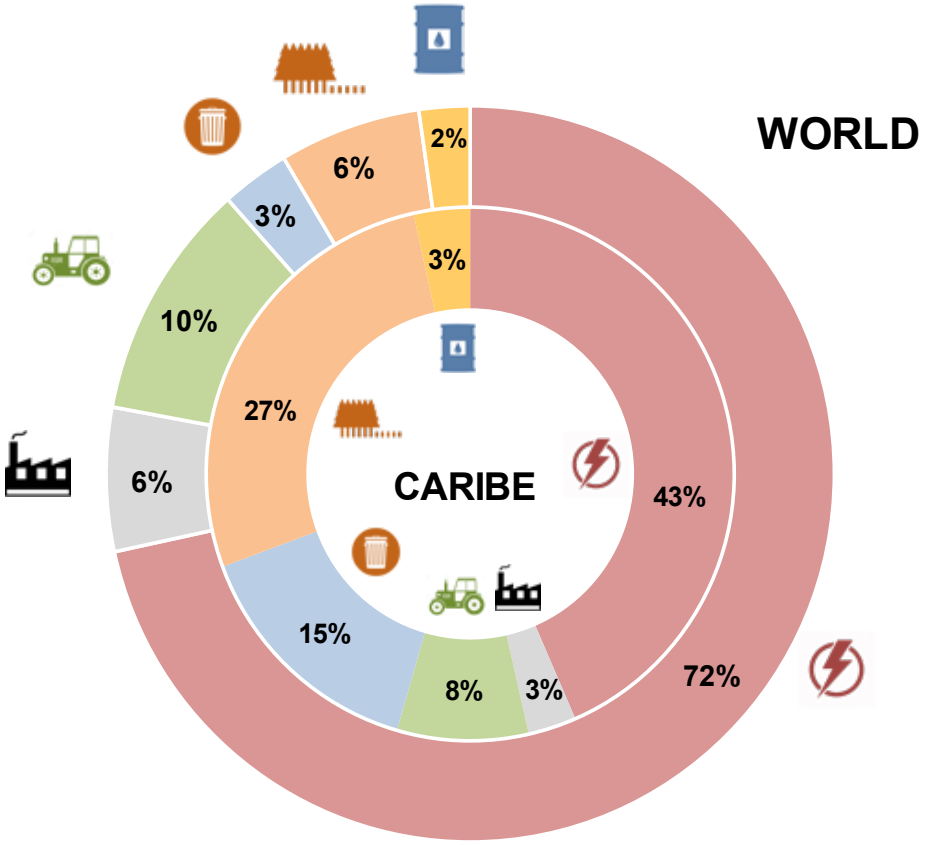
LAC region accounts for 5-8% of global CO_2 emissions



Source: ECLAC, based on information from the Climate Analysis Indicator Tool (CAIT), based on CDIAC, IEA, EIA y FAO. [online] http://cait.wri.org

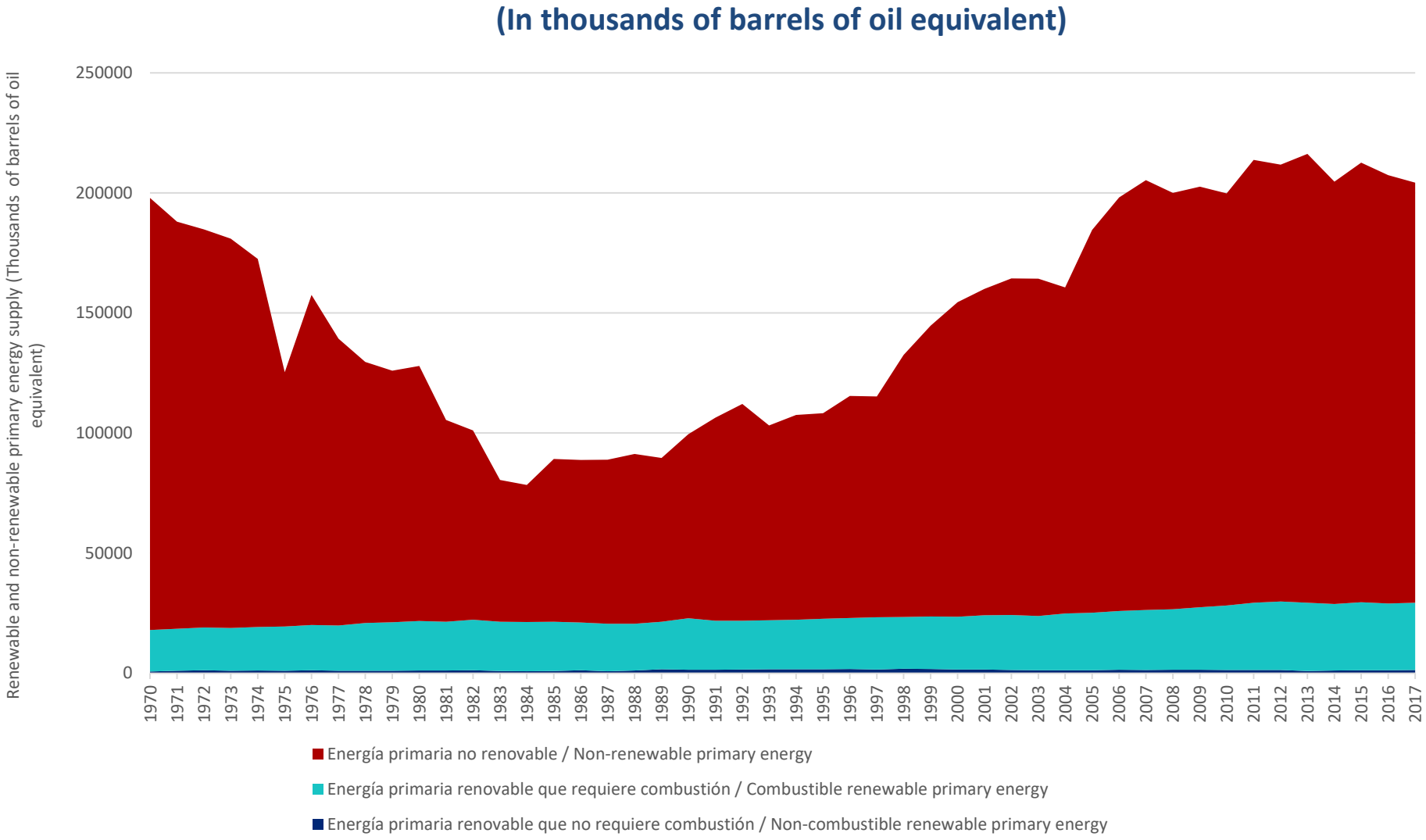


CARICOM and World: Sources of GHG Emissions, 2014



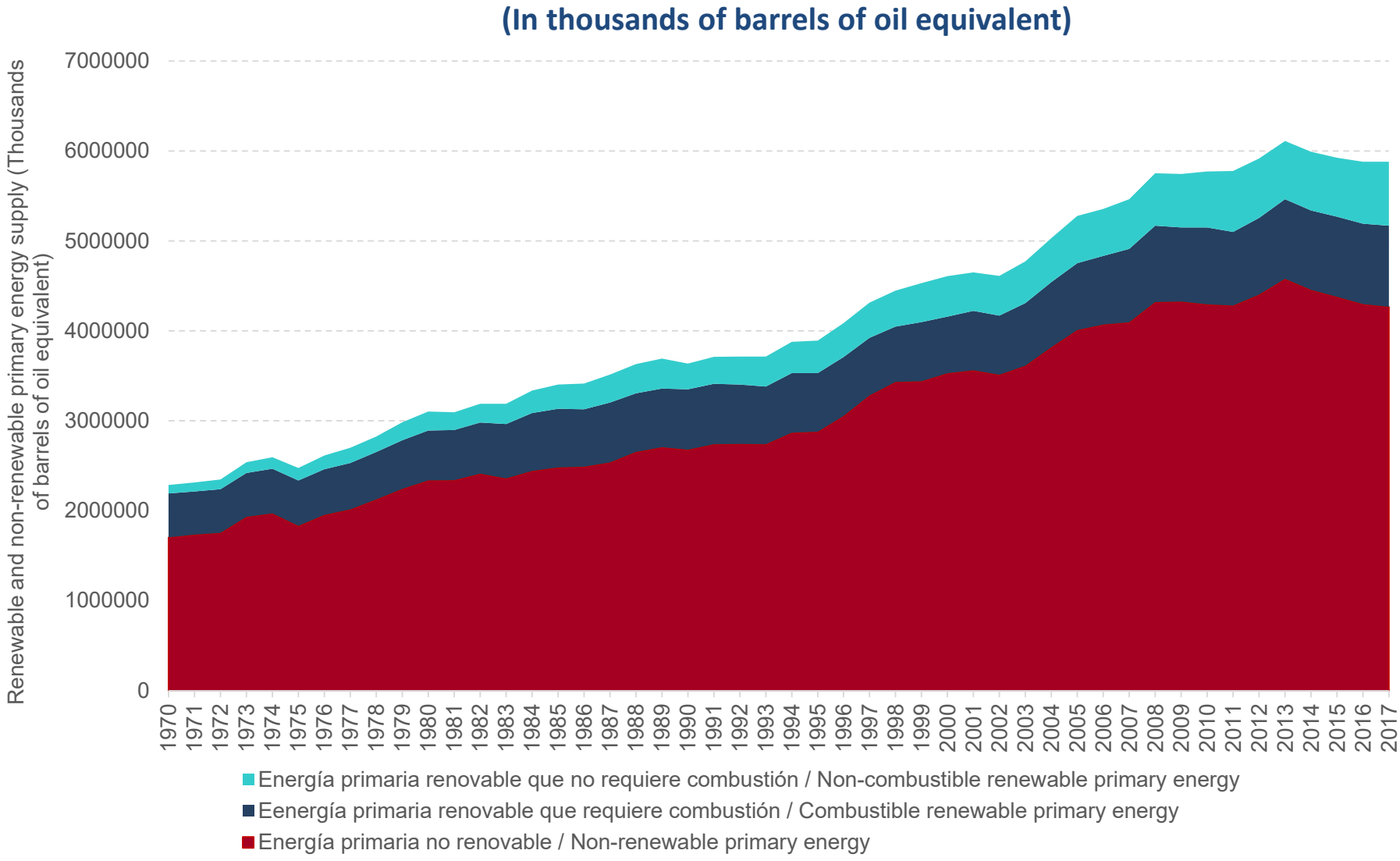
Source: World Resources Institute (WRI), Climate Analysis Indicator Tool [en línea] http://cait.wri.org

CARICOM: Renewable and Non-Renewable Primary Energy Supply, 1970-2017



Source: OLADE, Energy Information System of Latin America and the Caribbean (SIEE) [online] http://sier.olade.org

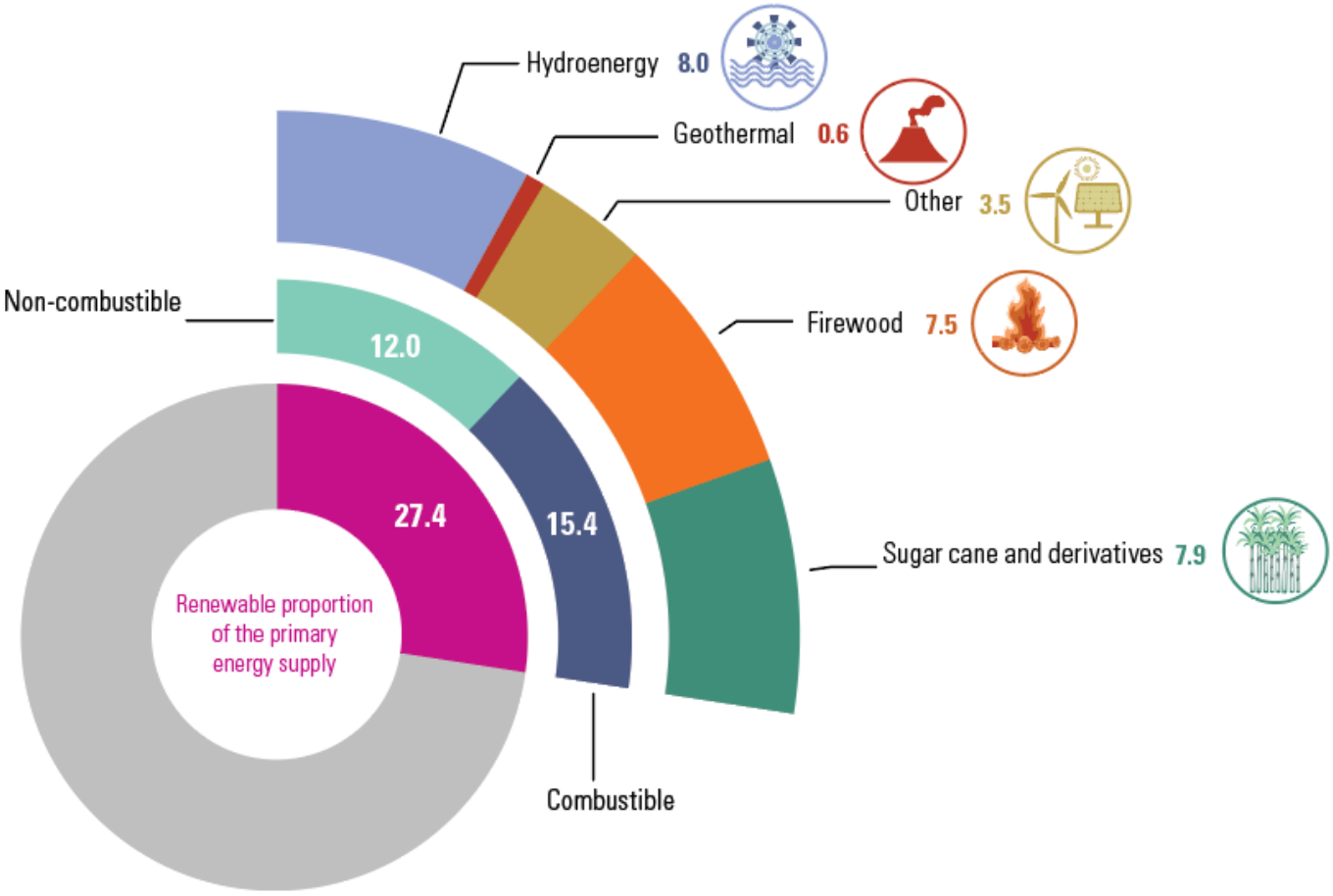
LAC: Renewable and Non-Renewable Primary Energy Supply, 1970-2017



Source: OLADE, Energy Information System of Latin America and the Caribbean (SIEE) [online] http://sier.olade.org

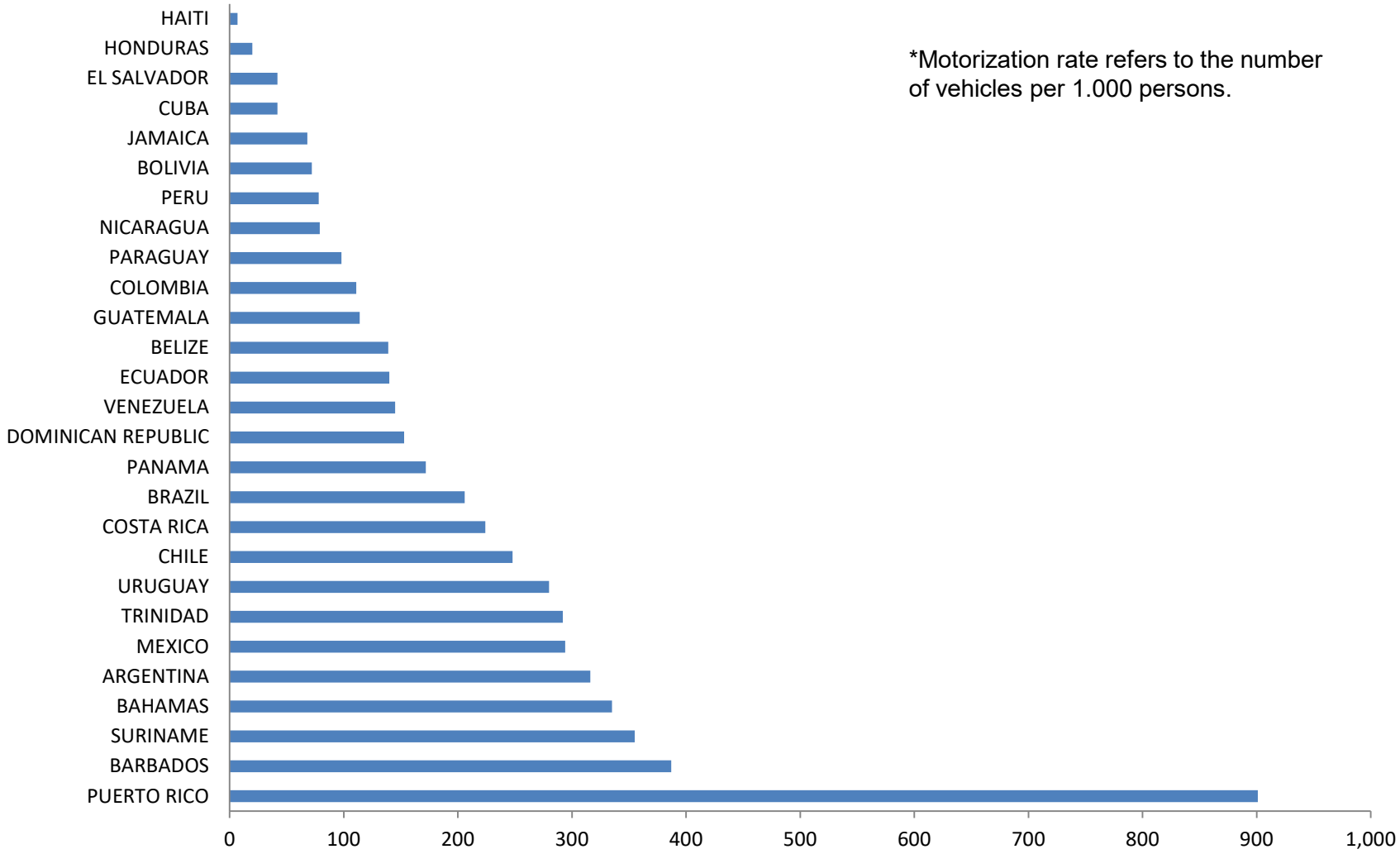
Latin America and the Caribbean: Renewable Primary Energy Supply by Energy source, 2017

(In percentages)



Source: CEPAL, calculated on the basis of OLADE, Energy Information System of Latin America and the Caribbean (SIEE) [online] http://sier.olade.org

LAC: Motorization rate* by country, 2015



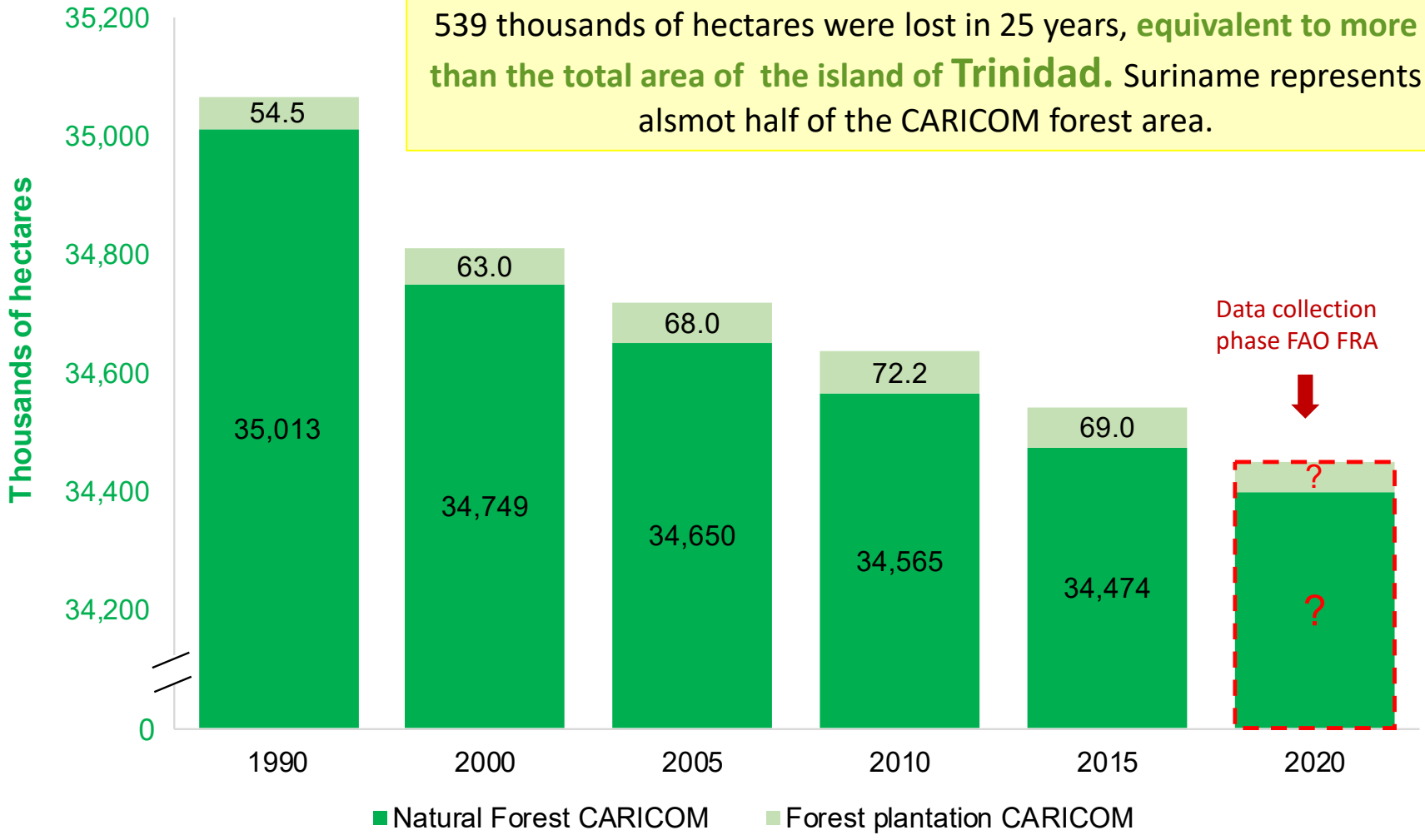
*Motorization rate refers to the number of vehicles per 1.000 persons.

Source: International Organization of Motor Vehicle Manufacturers(OICA) http://www.oica.net/category/vehicles-in-use/

CARICOM: Natural Forest and Forest Plantation Areas, 1990-2015

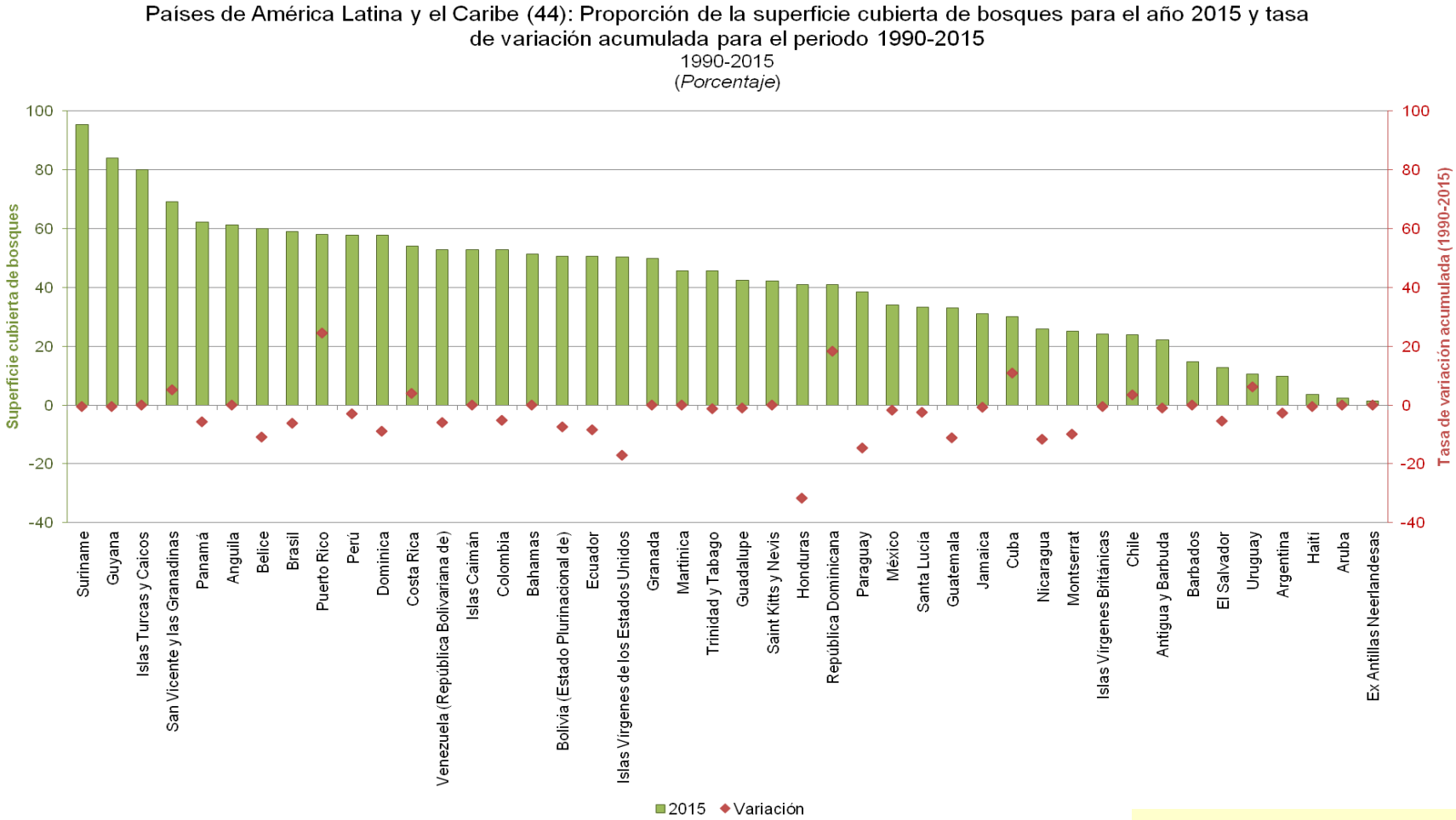
In thousands of hectares by forest type

539 thousands of hectares were lost in 25 years, **equivalent to more than the total area of the island of Trinidad.** Suriname represents alsmot half of the CARICOM forest area.



Source: ECLAC based on data from the Food and Agriculture Organization of the United Nations (FAO); Global Forest Resources Assessment (FRA) 2015

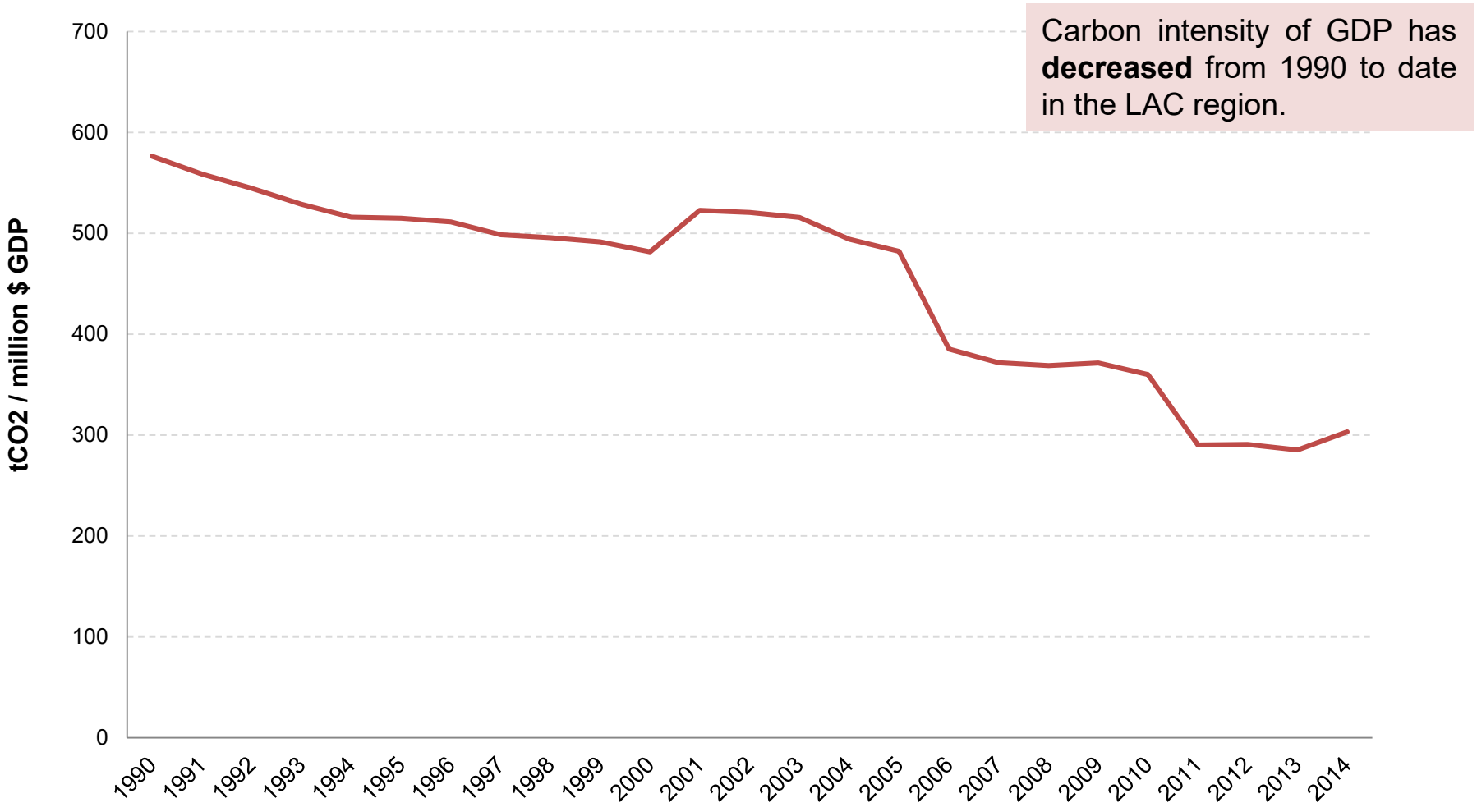
LAC: forest area and cumulative variation rate for 1990-2015, by country



SDG indicator 15.2.1

Fuente: Comisión Económica para América Latina y el Caribe (CEPAL), Base de datos de publicaciones estadísticas (CEPPALSTAT), sobre la base de cálculos realizados con la superficie nacional de bosques de *Evaluación de los recursos forestales mundiales 2015 (FRA 2015)* y la superficie terrestre nacional de las Bases de datos estadísticos de la FAO (FAOSTAT)

LAC: Carbon intensity of GDP (tCO2 / Million $ GDP$_{constant}$)



Source: World Resource Institute (WRI), Climate Analysis Indicator Tool [en línea] http://cait.wri.org

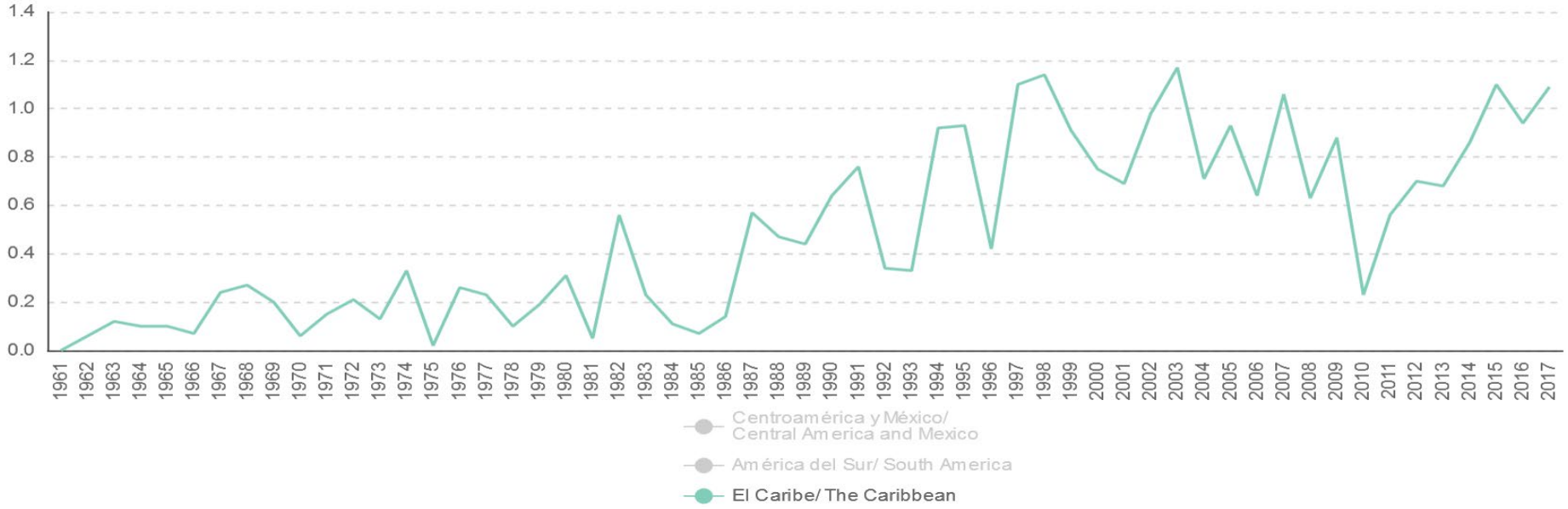
CC Evidence indicators: examples

Evidence: Caribbean Average Annual Temperature Variation, 1961-2017(°C)

LAC accounts for only **8% of the 2014 global GHG emissions**. However, it is acutely vulnerable to climate change consequences, particularly the Caribbean SIDS.

Aggregate estimates put the economic cost of **a 2.5°C** rise in temperature for the LAC region at between **1.5% and 5% of the region's current GDP.**

Mean annual temperature change in the Caribbean*, 1961-2017

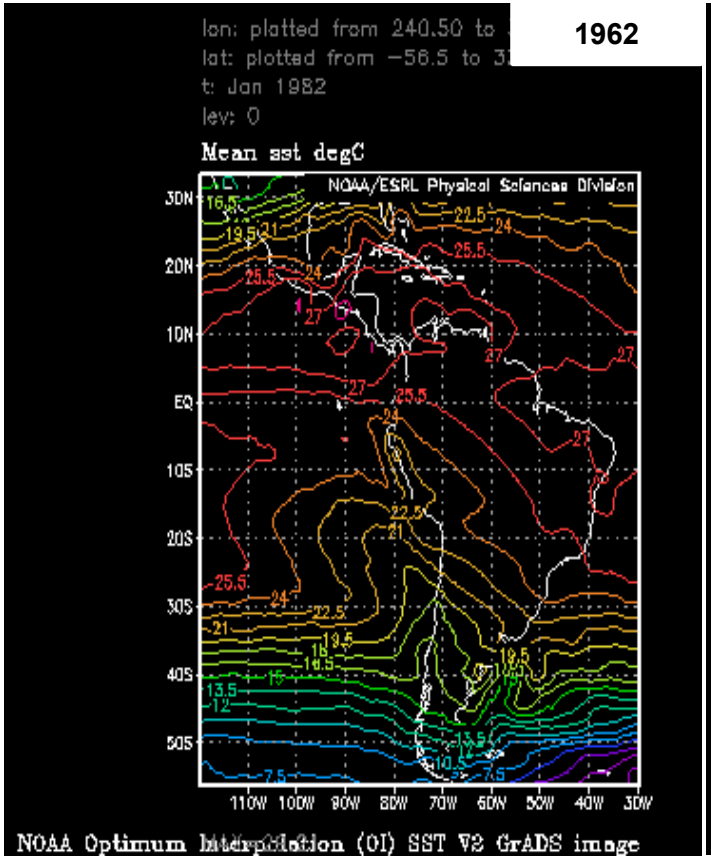


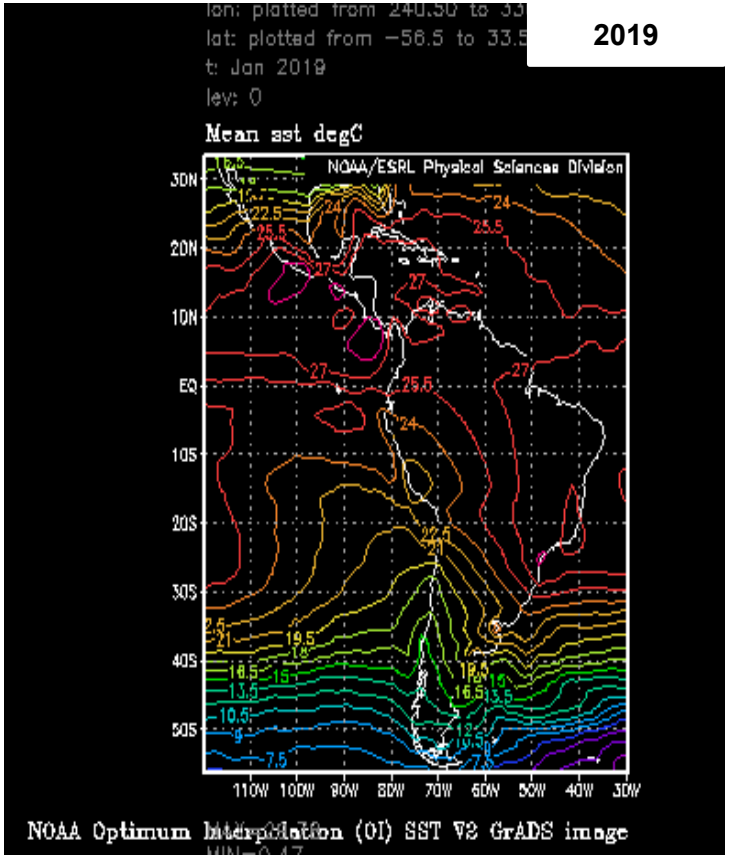
Source: Economic Commission for Latin America and the Caribbean (ECLAC), *2018Statistical Yearbook for Latin America and the Caribbean* (LC/PUB.2019/2-P), Santiago, 2019, based on FAO, *Database for Statistical Data* (FAOSTAT) [online] http://www.fao.org/faostat/en/#home.

* Includes Cuba and the Dominican Republic.

Evidence of CC Occurrence: Climate Change Regional Patterns

Latin America and the Caribbean: Changes in average Sea Surface Temperature (SST)

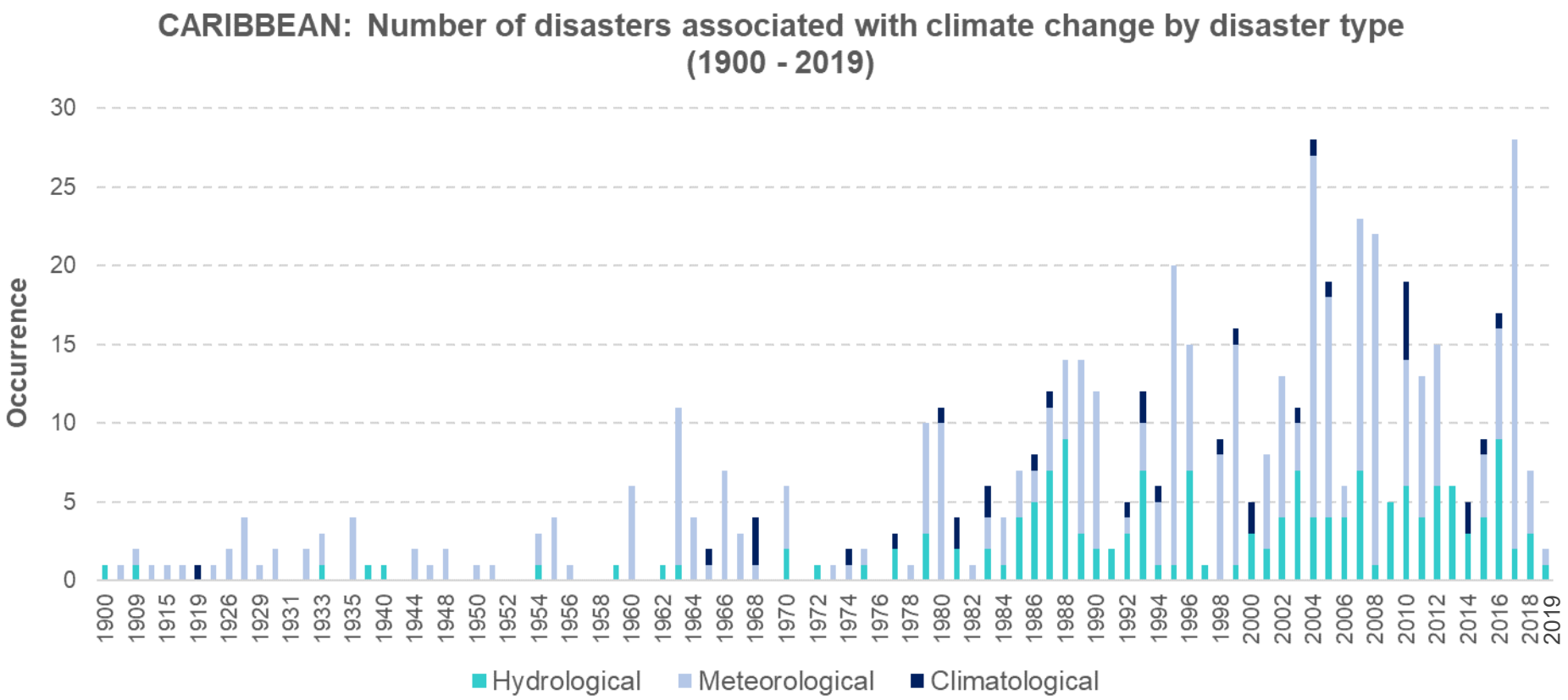




In this comparison we observe an increase of average sea surface temperature from North to South. It should be noted that this source performs satellite monitoring, therefore the data is first observed and then complemented by buoys at sea, allowing the temperature to be measured.

Source: National Oceanic and Atmospheric Administration, NOAA

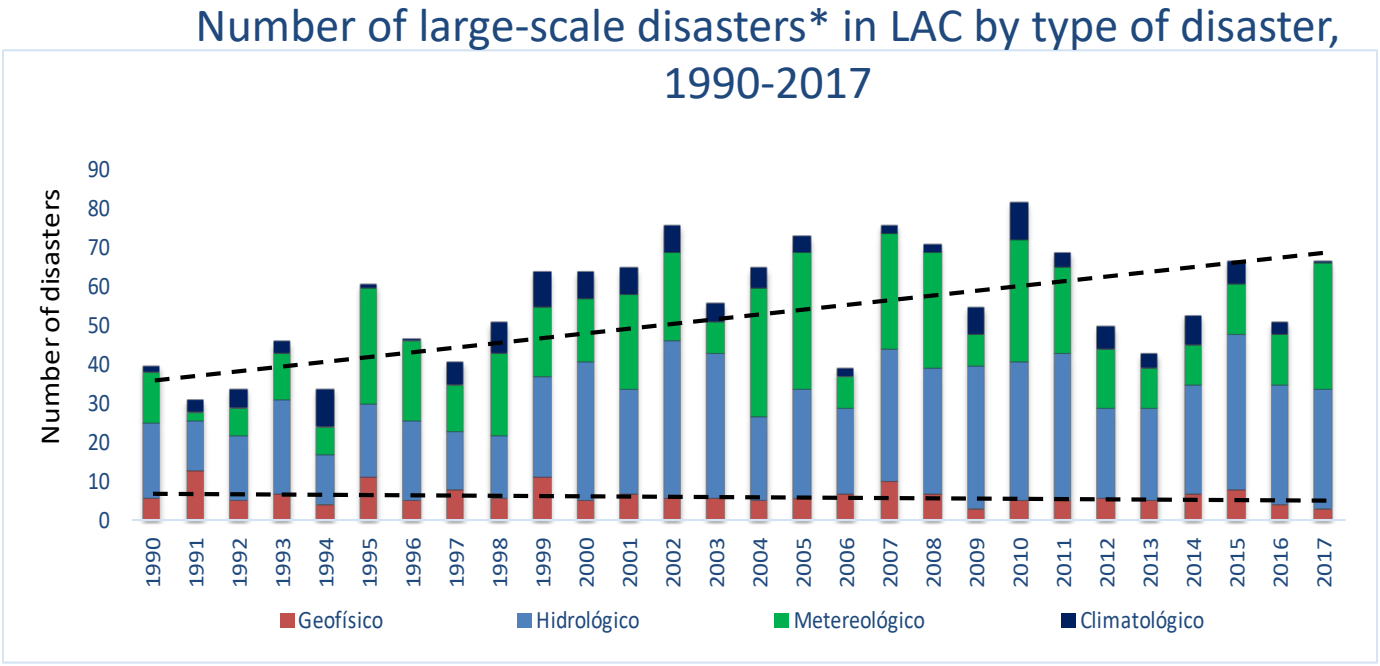
Caribbean: Number of Disasters Associated with Climate Change by Disaster Type, 1900-2019



Source: Centre for Research on the Epidemiology of Disasters (CRED) Catholic University of Louvain. The International Disaster Database (EM-DAT) http://www.emdat.be//Catholic

Measuring climate change in the Caribbean: the impact of disasters

The **2017 hurricanes season** in the Caribbean, including category 5-hurricanes Irma and Maria, resulted in **177 deaths** and more than **10 million affected people**.

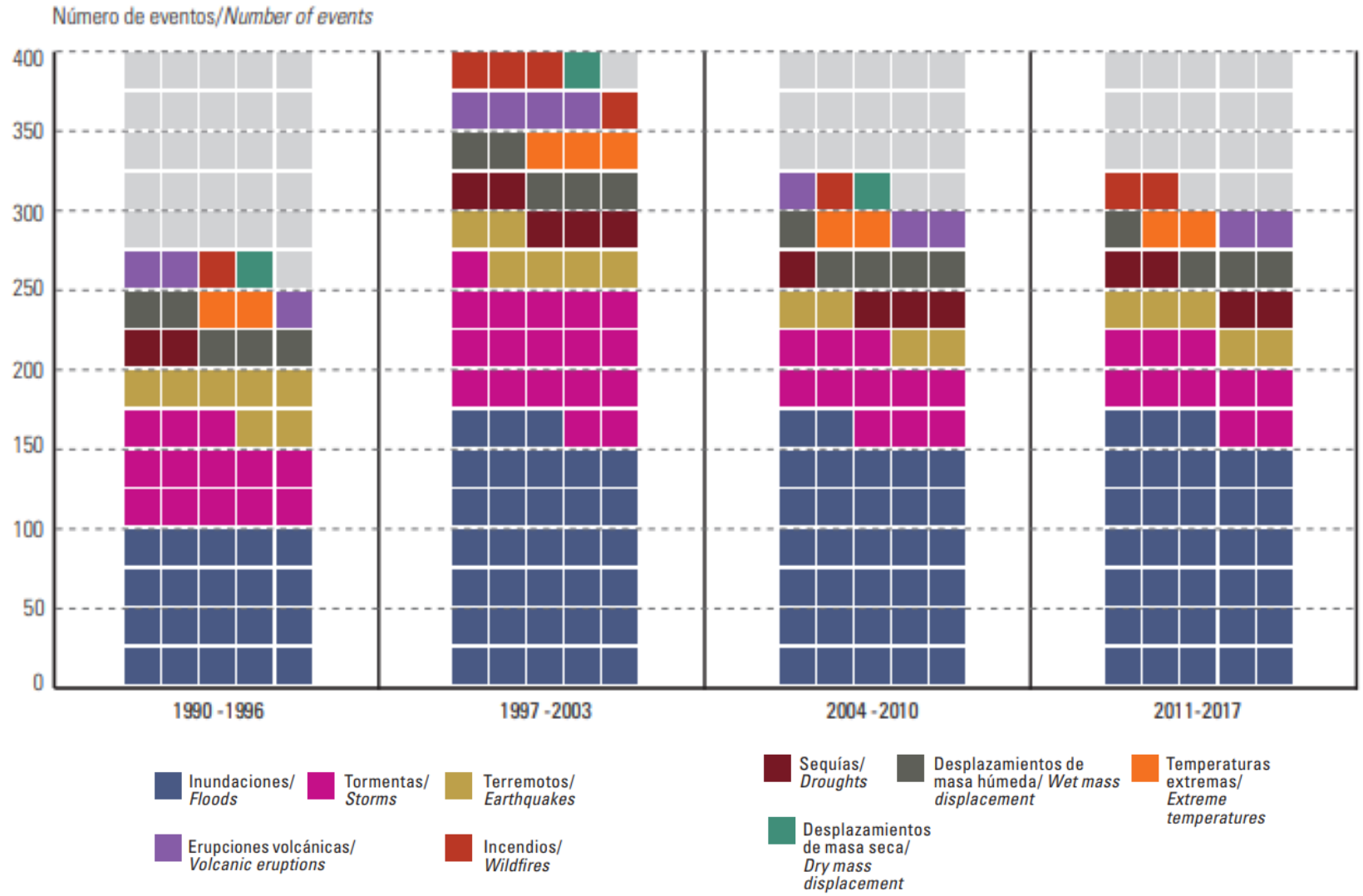


Source: EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium (http://www.emdat.be). Entered April 18

* According to the source, at least one of the following criteria must be fulfilled in order for an event to be entered into the database: (a) 10 or more people deaths; (b) 100 or more people affected/injured/homeless and/or (c) declaration by the country of a state of emergency and/or an appeal for international assistance.

Please note that according to UNISDR, over the last 25 years, small-scale disasters have accounted for more than half of human losses caused by climate events in Latin America and the Caribbean.

Latin America and the Caribbean: Number of Major Disasters by Disaster Type, 1990-2017

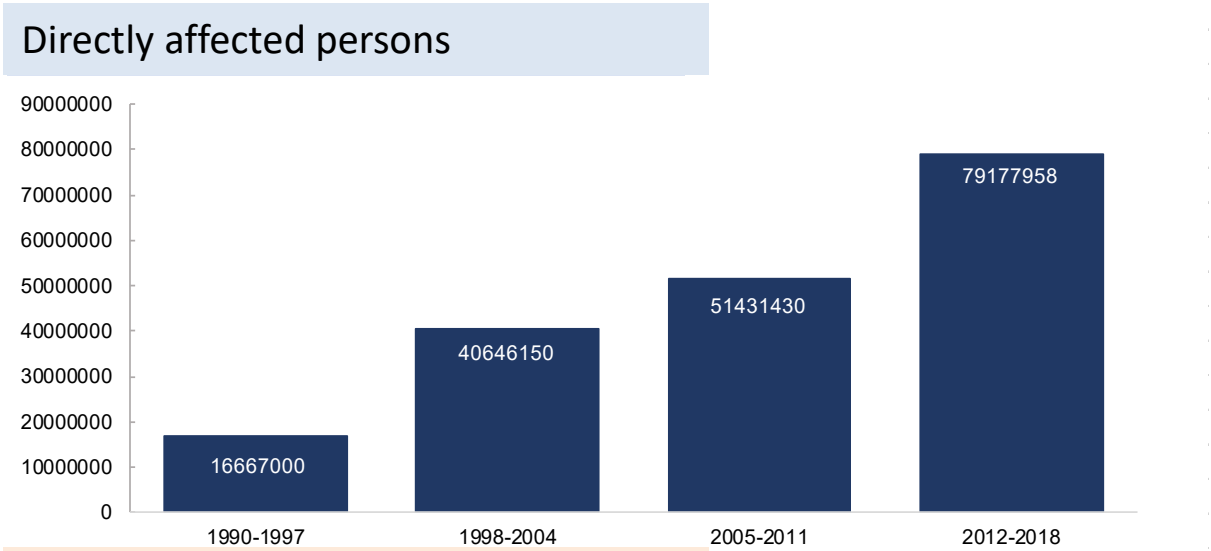


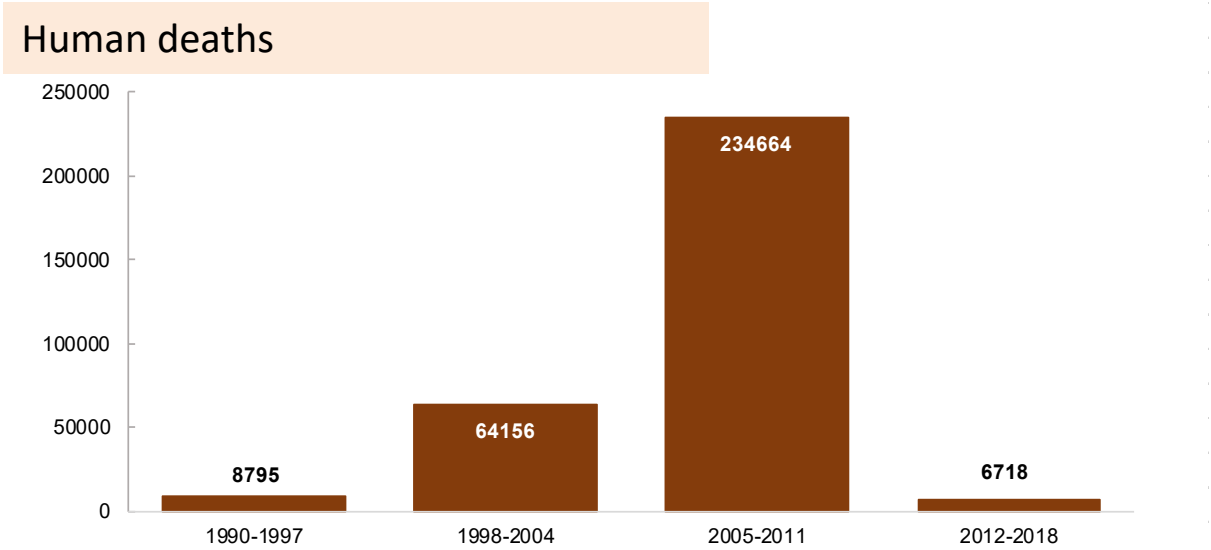
Each square represents 5 events. In the case of dry mass displacement, each square represents less than 2 events.

Source: EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium (http://www.emdat.be).
Updated in April 2018

CC Impacts indicators: examples

LAC: Number of Human Deaths and Persons Directly Affected by Disasters, 1990-2018

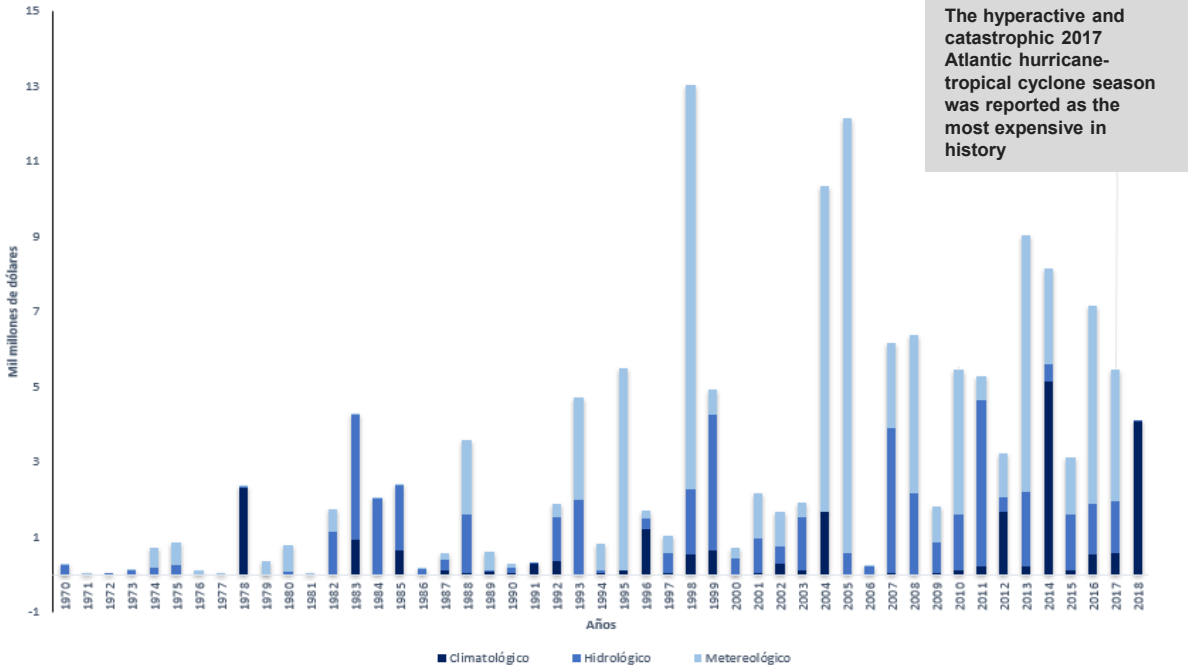




Source: EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium (http://www.emdat.be).

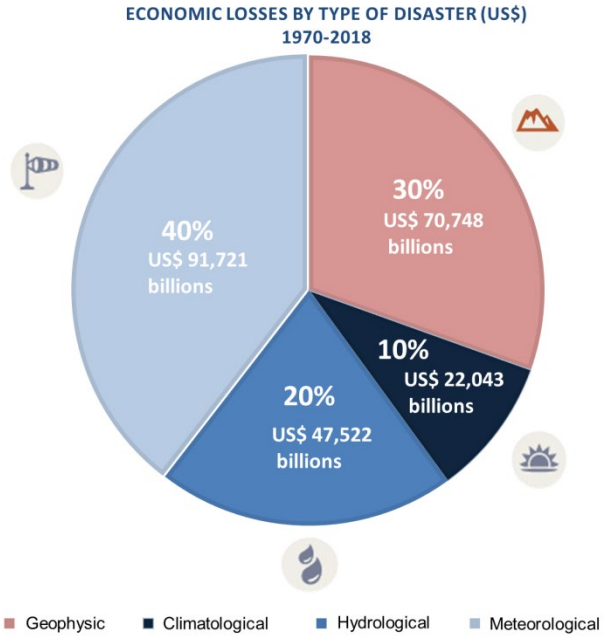
LAC: Economic cost of disasters associated with Climate Change, 1970-2018

Economic cost of disasters associated with climate change in LAC, 1970 – 2018 (by type of event)



The hyperactive and catastrophic 2017 Atlantic hurricane-tropical cyclone season was reported as the most expensive in history

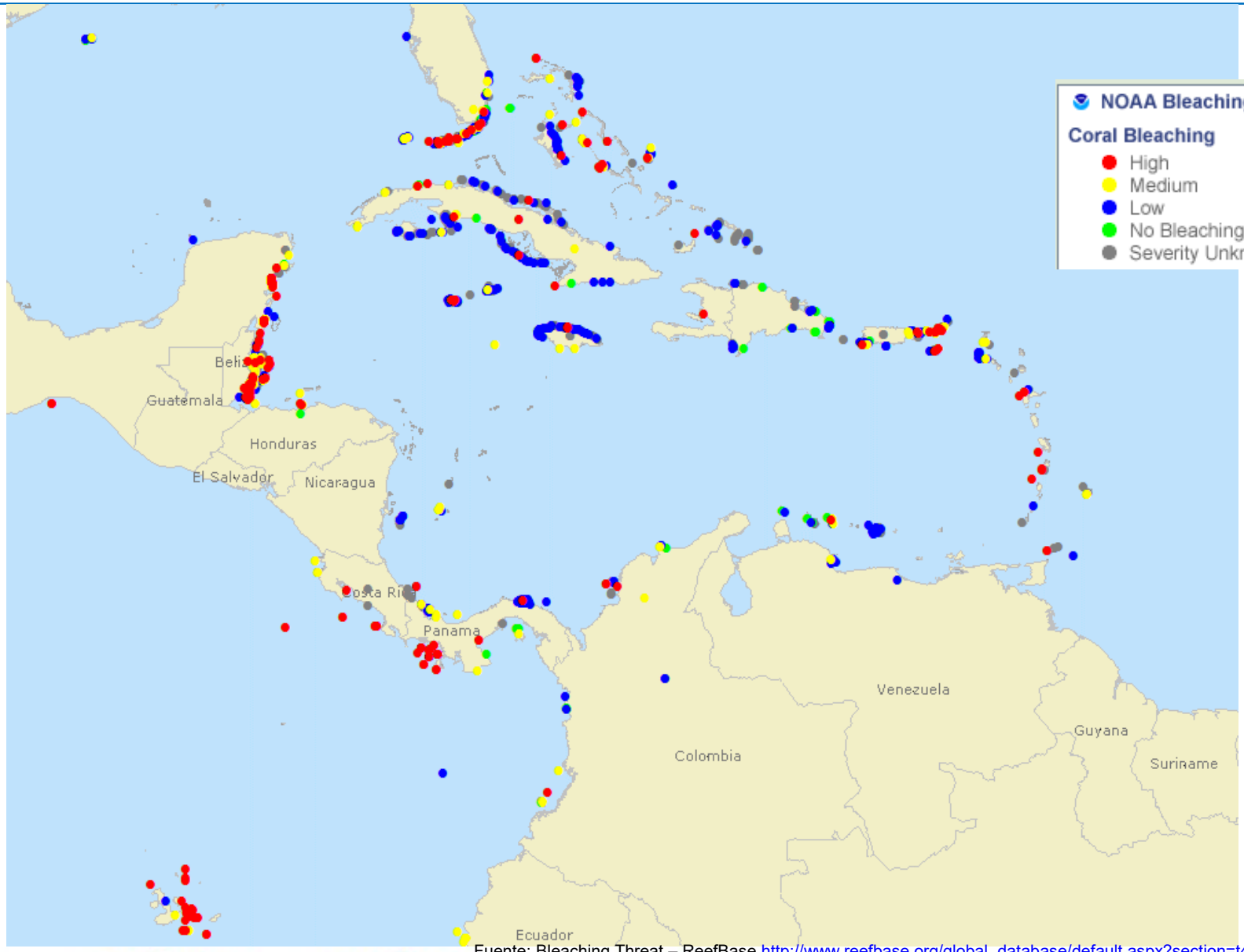
70% of economic losses (US$) from disasters in LAC are related to CC



NOTE: The **VALUE** of damages and economic losses directly or indirectly related to climate change disasters in the last 5 decades amounts to 161 **billions of dollars**.

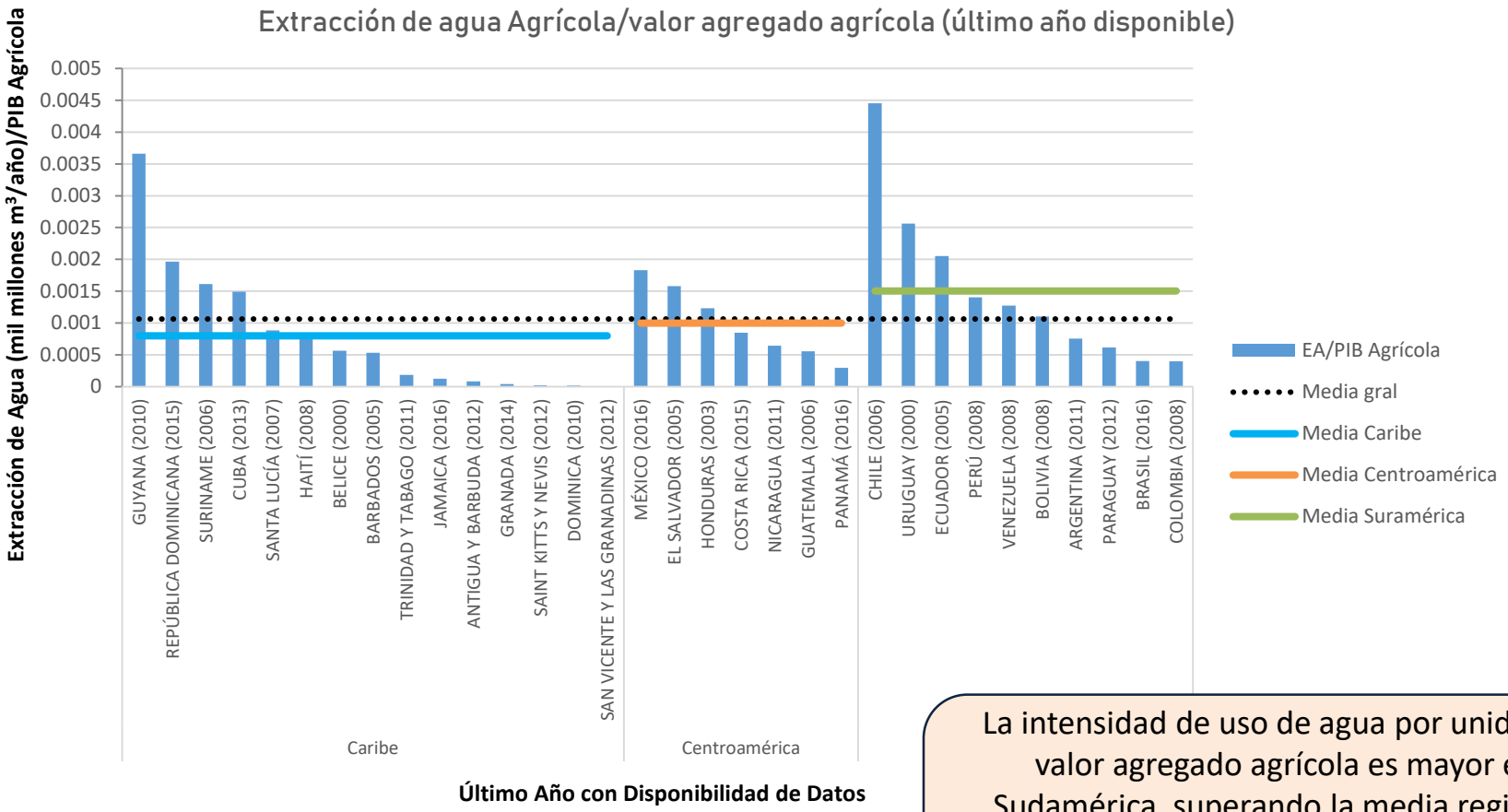
Source: Centre for Research on the Epidemiology of Disasters (CRED) Catholic University of Louvain. The International Disaster Database (EM-DAT) http://www.emdat.be//Catholic

LAC: coral bleaching according to NOAA categories, 1963 - 2018



Fuente: Bleaching Threat – ReefBase http://www.reefbase.org/global_database/default.aspx?section=t4

LAC: water withdrawal per agricultural agregated value, last available year



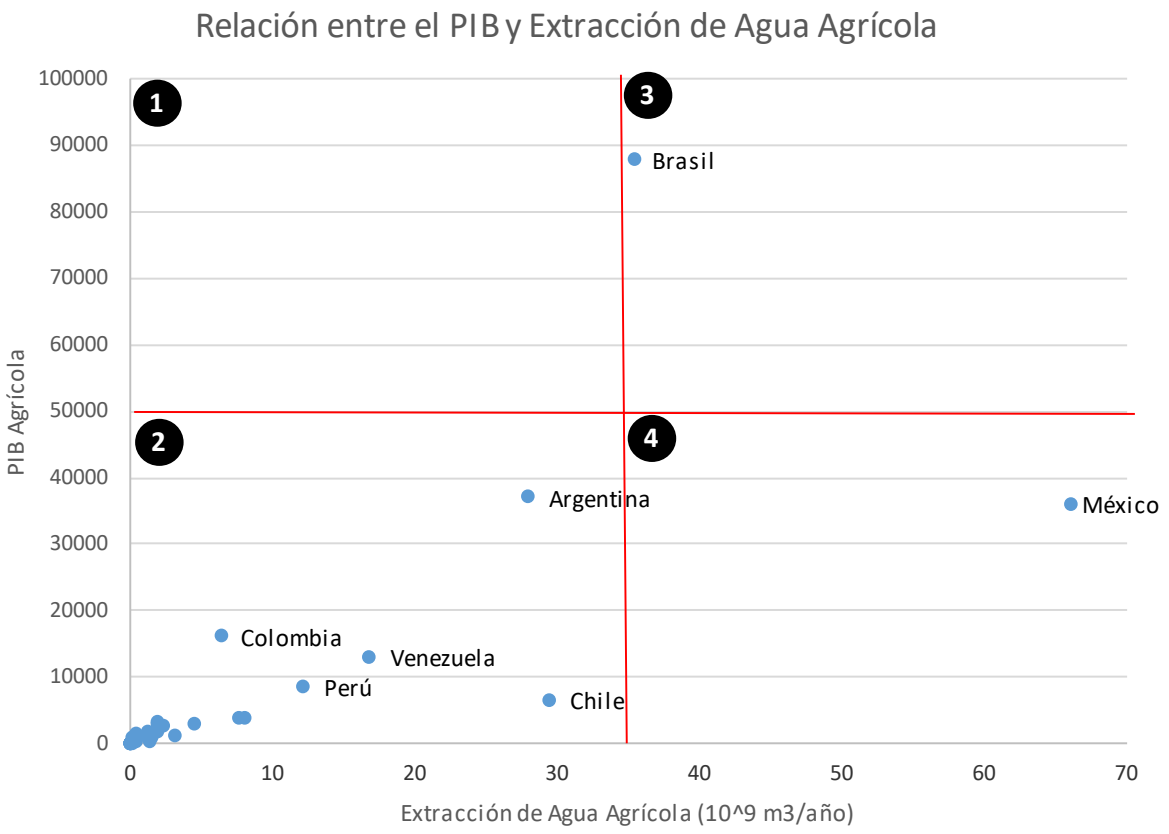
La intensidad de uso de agua por unidad de valor agregado agrícola es mayor en Sudamérica, superando la media regional. Centroamérica tienen una media similar a la regional y El Caribe por debajo de la media regional.

Fuente: FAO, Bases de datos Aquastat y CEPALSTAT

LAC: water withdrawal per agricultural agregated value, last available year

1 Países con alto valor agregado agrícola y bajo consumo de agua. Países eficientes. Ninguno

2 Países con bajo valor agregado agrícola y bajo consumo de agua. Casi todos

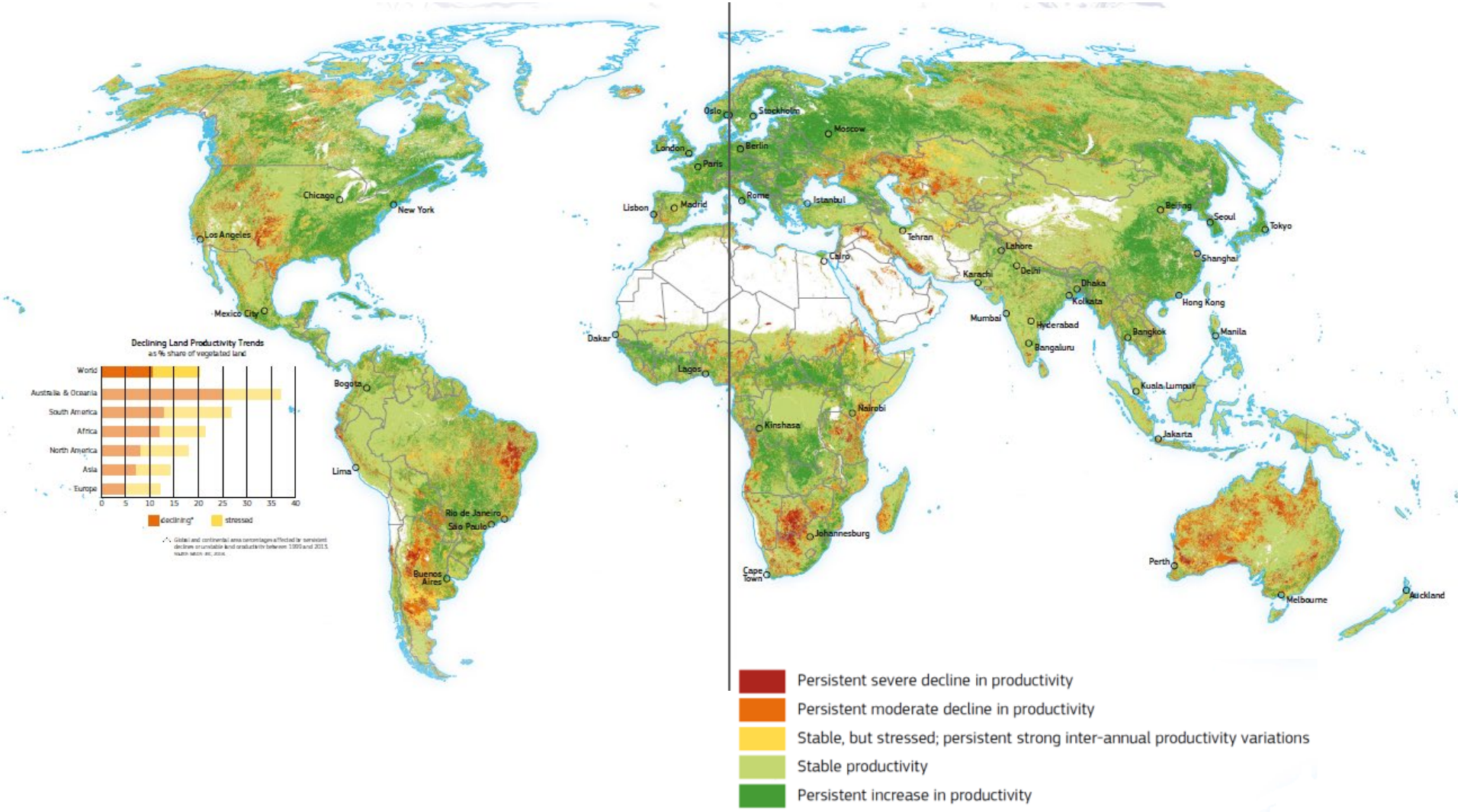


3 Países con alto valor agregado agrícola y alto consumo de agua. Brasil

4 Países con bajo valor agregado agrícola y alto consumo de agua. Países ineficientes. México

Fuente: FAO, Base de datos de agua Aquastat y Cepalstat

World: Land productivity PPN, 1999-2013



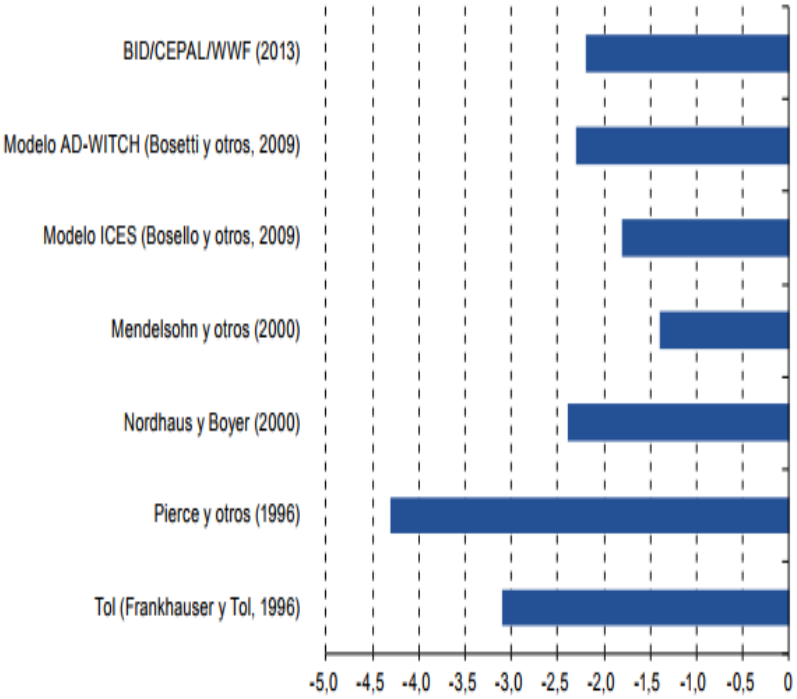
Fuente: Cherlet, M., Hutchinson, C., Reynolds, J., Hill, J., Sommer, S., von Maltitz, G. (Eds.), *World Atlas of Desertification*, Publication Office of the European Union, Luxembourg, 2018.

Economic cost of Climate Change

Regional estimation: global warming of 2.5°C (c2050): **Economic cost of 1,5% - 5% of current regional GDP**

Gráfico II.1

Impacts of Climate Change in Latin America and the Caribbean with a Global Warming of 2,5ºC, Second Half of 21st Century
(In percentages of regional GDP)



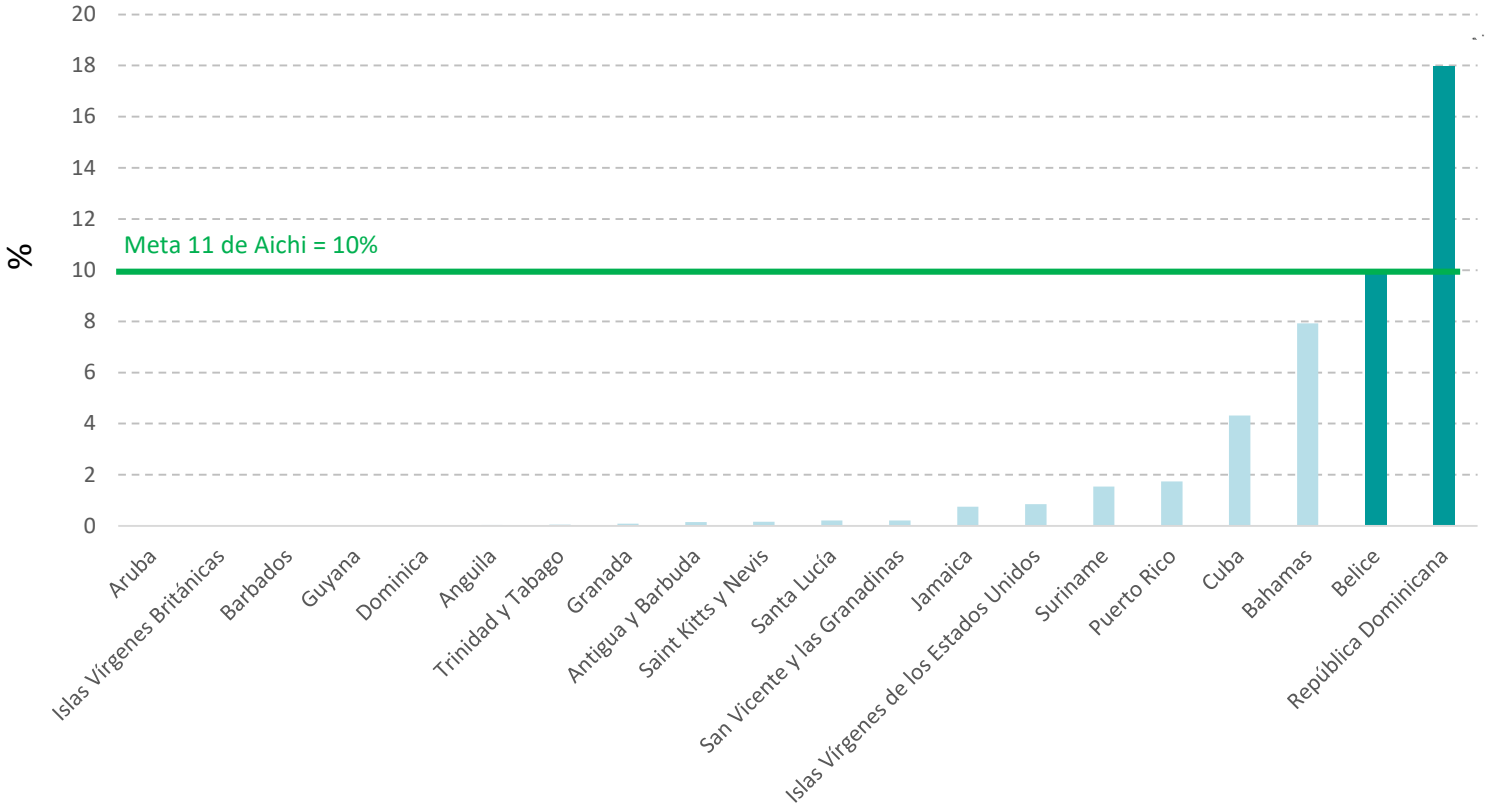
Note: Estimates present high uncertainty, are conservative, limited to certain sectors and regions, and have various methodological limitations (difficulty in incorporating adaptation processes and potential effects of extreme climatic phenomena. Stern, 2013).

Fuente: Comisión Económica para América Latina y el Caribe (CEPAL), sobre la base de F. Bosello, C. Carraro y E. De Cian, "Market- and policy-driven adaptation", *Smart Solutions to Climate Change: Comparing Costs and Benefits*, Bjørn Lomborg (ed.), Cambridge University Press, 2010.

[a] Los impactos del cambio climático ante un aumento de temperatura de 2,5 °C en América Latina provienen de Bosello, Carraro y De Cian (2010). El dato del impacto en BID/CEPAL/WWF proviene de Vergara y otros (2013), se refiere al impacto a 2050.

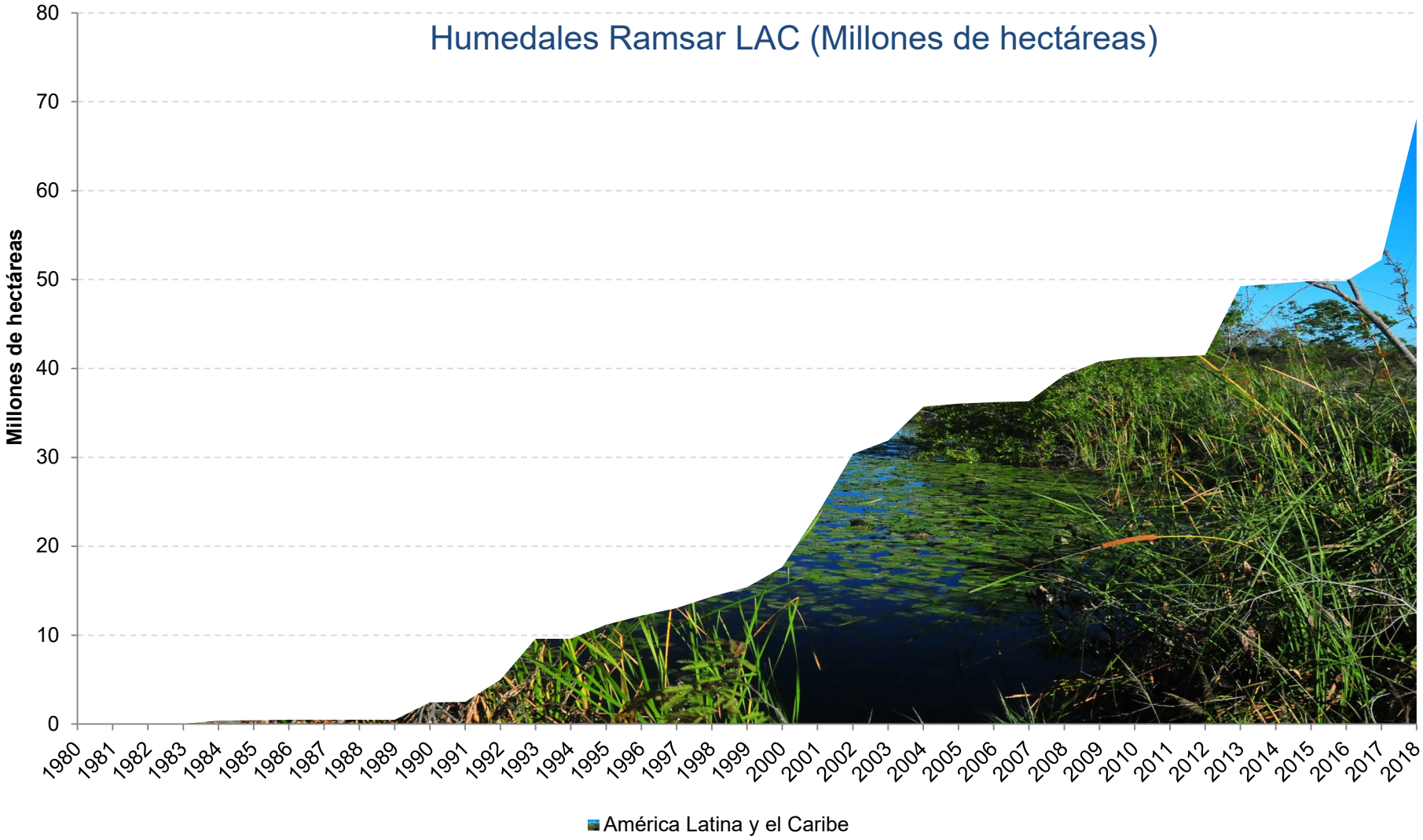
CC Mitigation and adaptation indicators: examples

Marine protected areas compared to marine area by CARICOM countries, 2018



Fuente: Naciones Unidas, “SDG Indicators Global Database” [base de datos en línea] https://unstats.un.org/sdgs/indicators/database/United Nations

LAC: Ramsar sites area, 1980-2018



Fuente: Ramsar: - Convención relativa a los humedales de importancia internacional, especialmente como hábitat de aves acuáticas - http://www.ramsar.org

2 Demands for regionally relevant climate change-related metrics and work program

Latin American and Caribbean Region / Climate Change

"The Latin American and Caribbean region is in an **asymmetrical position** in relation to climate change. The region has made a historically **small contribution** to climate change yet it is **highly vulnerable** to its effects and will, moreover, be involved in the possible solutions in several ways." (ECLAC, 2014)

Recommendations and Main Challenges

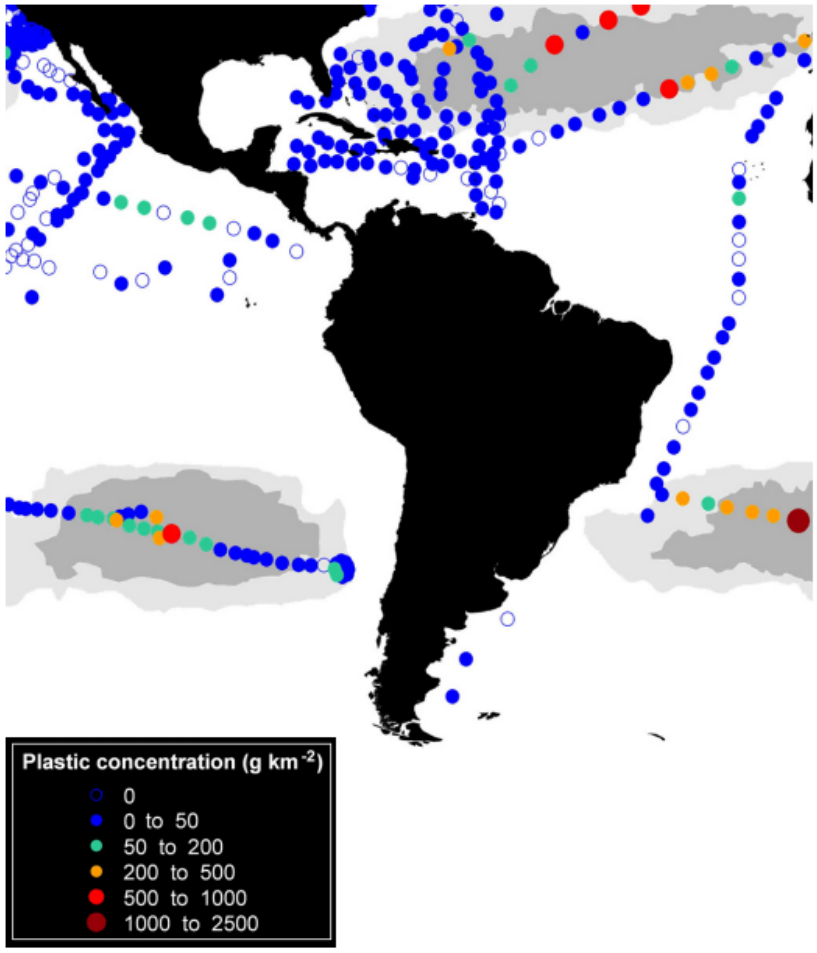
Towards a regional framework on climate change and disaster indicators

- **ECLAC**
  - Producing regional CC indicators, focusing on impact and **adaptation** (region and subregion)
  - Building a list of regionally relevant indicators for climate change reporting (keeping in mind the global list currently being drafted)
  - Focusing on occurrence and impact of disasters, environmental health, impact on agriculture and tourism, loss of mangroves and coral bleaching
- **Member-States**: ECLAC and Regional Experts are supporting national production of climate change statistics and encourage Member States to:
  - Assess data availability on climate change to build on the existing
  - Develop CC indicators starting with the most relevant issues for the region (i.e. disasters and adaptation)

Main challenges

- Developing mitigation statistics other than renewables, electromobility, etc.
- Developing indicators to relate natural resource use, biodiversity with climate change and development
- Developing adaptation indicators as they are spatially specific (potential collaboration with UBA Germany)
- Developing indicators related to build back better

Figure 2.3.4: Concentrations of plastic debris in surface waters of LAC. Coloured circles indicate mass concentrations. Gray areas indicate predicted accumulation zones.

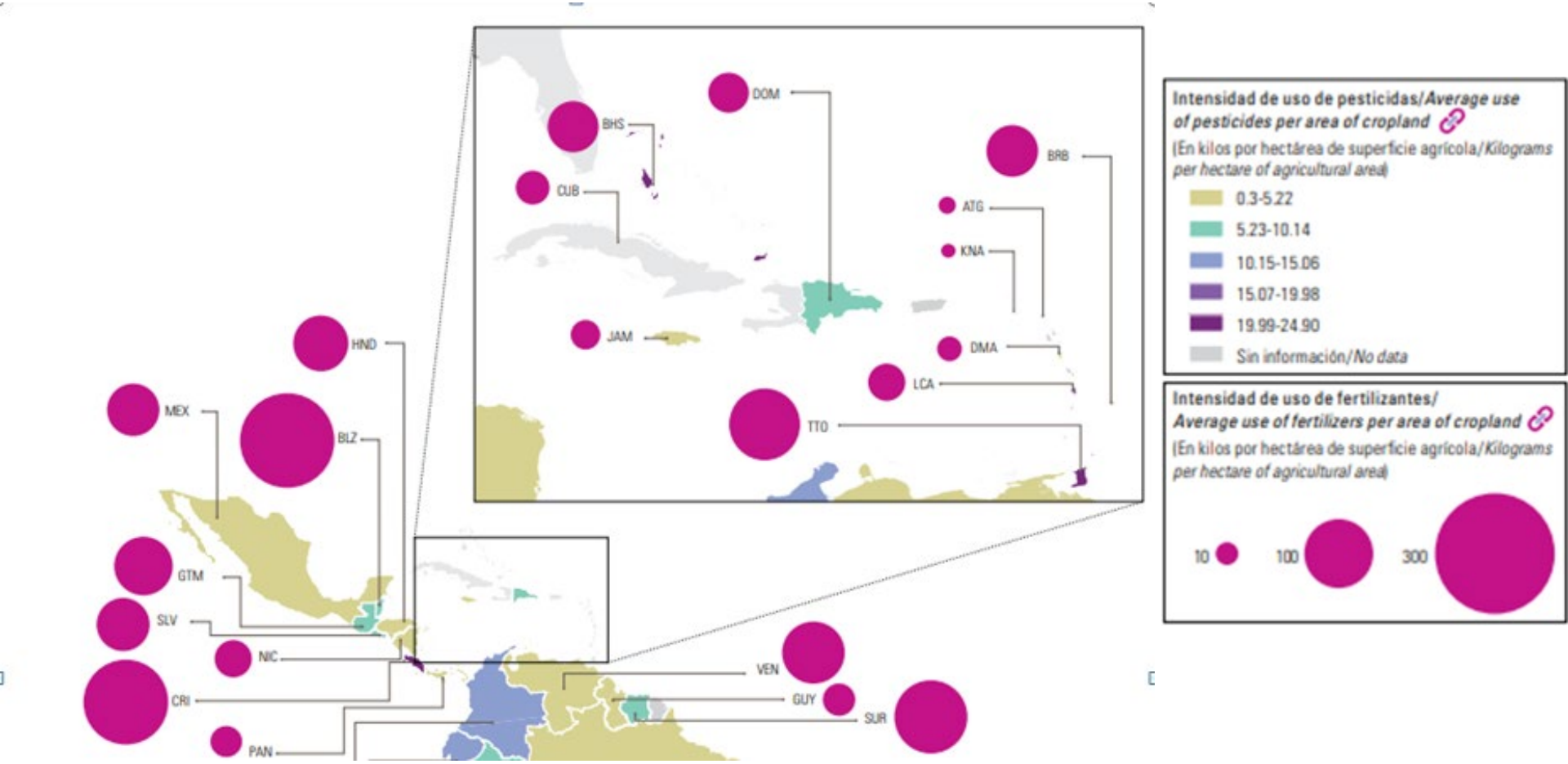


Source: modified from Cozar *et al.* 2014

Fuente: UNEP 2016. GEO-6 Regional Assessment for Latin America and the Caribbean. United Nations Environment Programme, Nairobi, Kenya.

- Áreas grises indican predicción de zonas de acumulación.

CARICOM: intensity use of fertilizers and pesticides, 2016

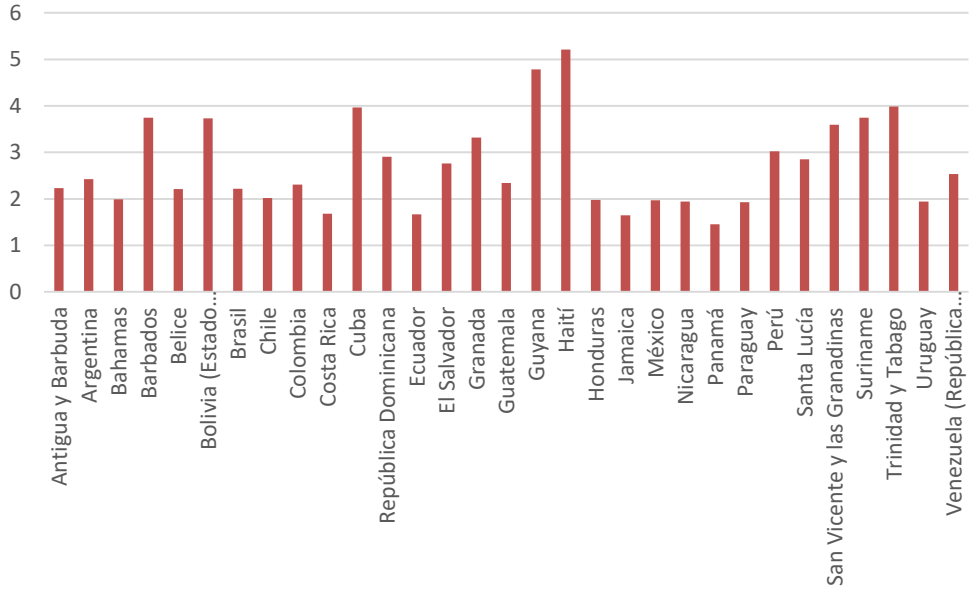


Source: ECLAC based on data from the Food and Agriculture Organization of the United Nations (FAO);

En 2016, la contaminación atmosférica quitó más de cuatro millones de años de vida saludable a la población de América Latina y el Caribe.

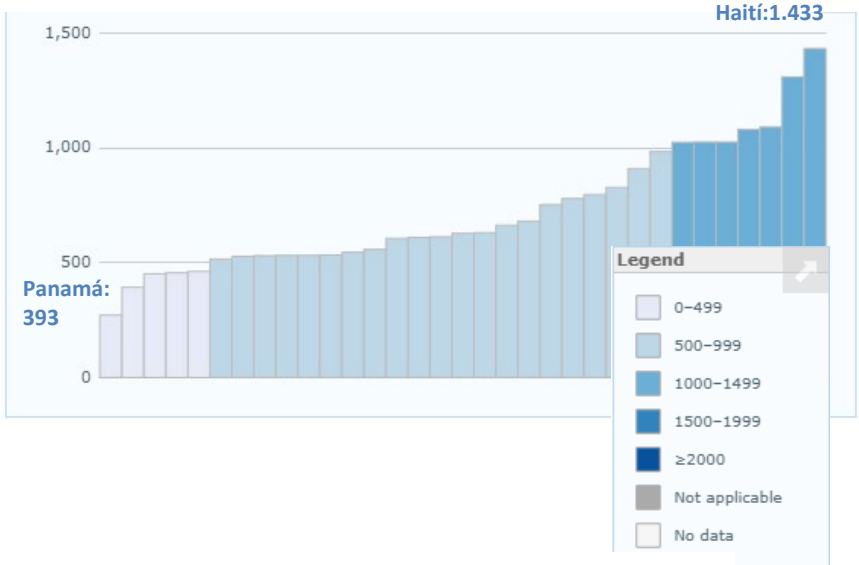
En Haití, en 2016, cada persona perdió más de **5 días** de vida saludable por la contaminación, mientras cada Panameño perdió **1 día y medio**.

Días de vida saludable perdidos por persona por la contaminación del aire, 2016



Fuente: CEPAL basado en Organización Mundial de la Salud (OMS), Observatorio Mundial de la Salud, https://www.who.int/gho/phe/outdoor_air_pollution/burden/en/ , 2018

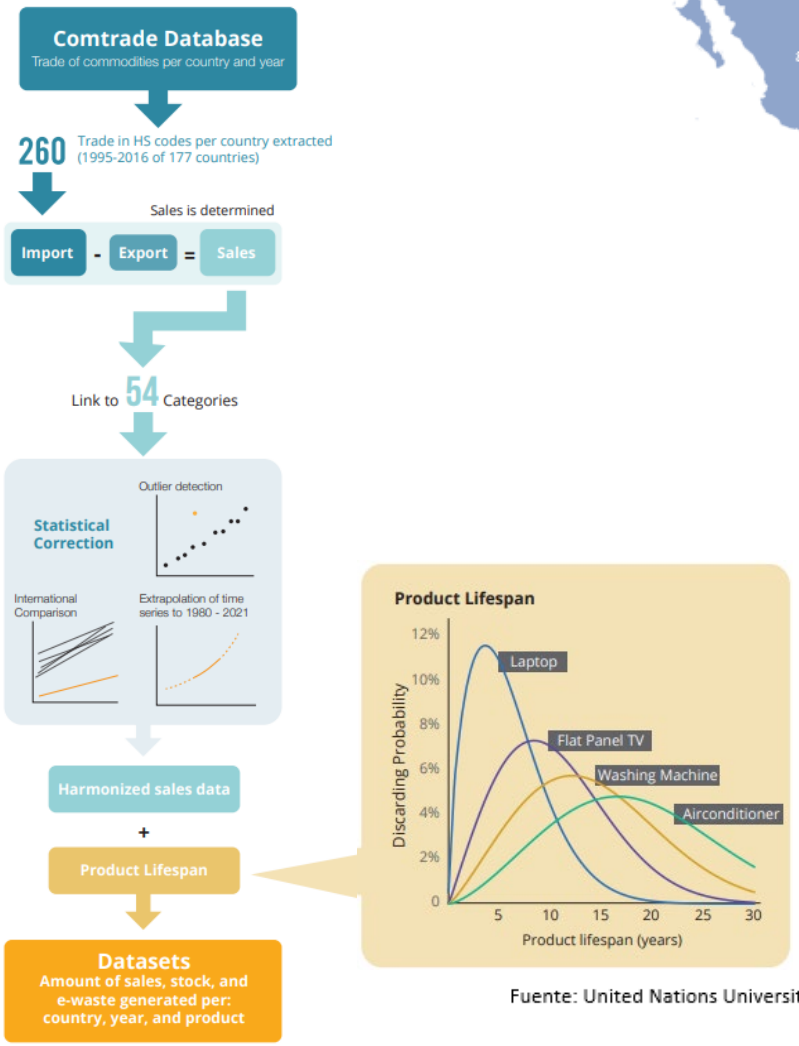
América Latina y el Caribe: Número de años de vida ajustados por la discapacidad (DALY en inglés) atribuible a la contaminación del aire (por 100.000 habitantes), 2018

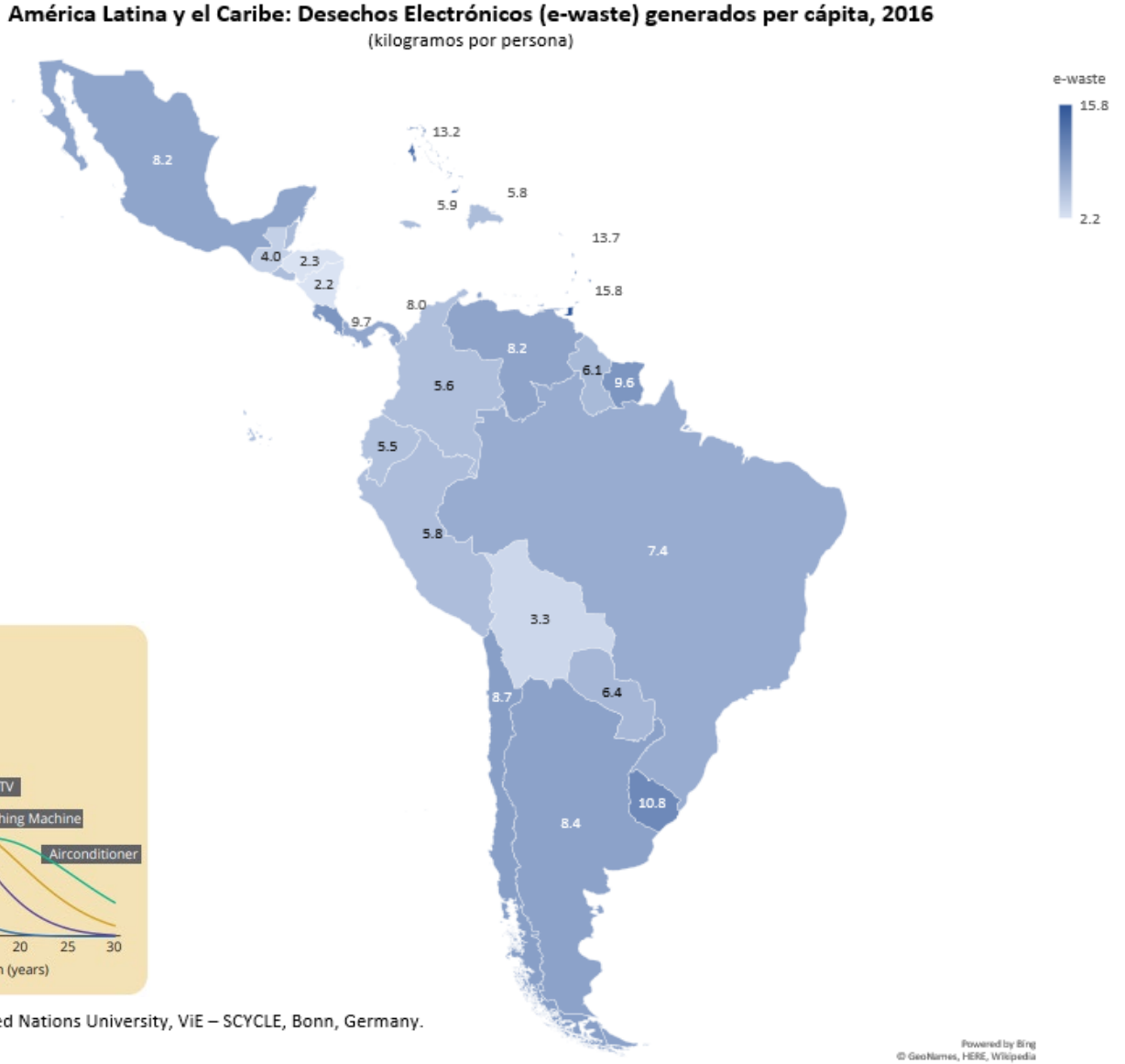


Fuente: Organización Mundial de la Salud (OMS), Observatorio Mundial de la Salud, https://www.who.int/gho/phe/outdoor_air_pollution/burden/en/ , 2018

América Latina y el Caribe: Desechos electrónicos (e-waste) generados per cápita, 2016

Nota: metodología en análisis y validación

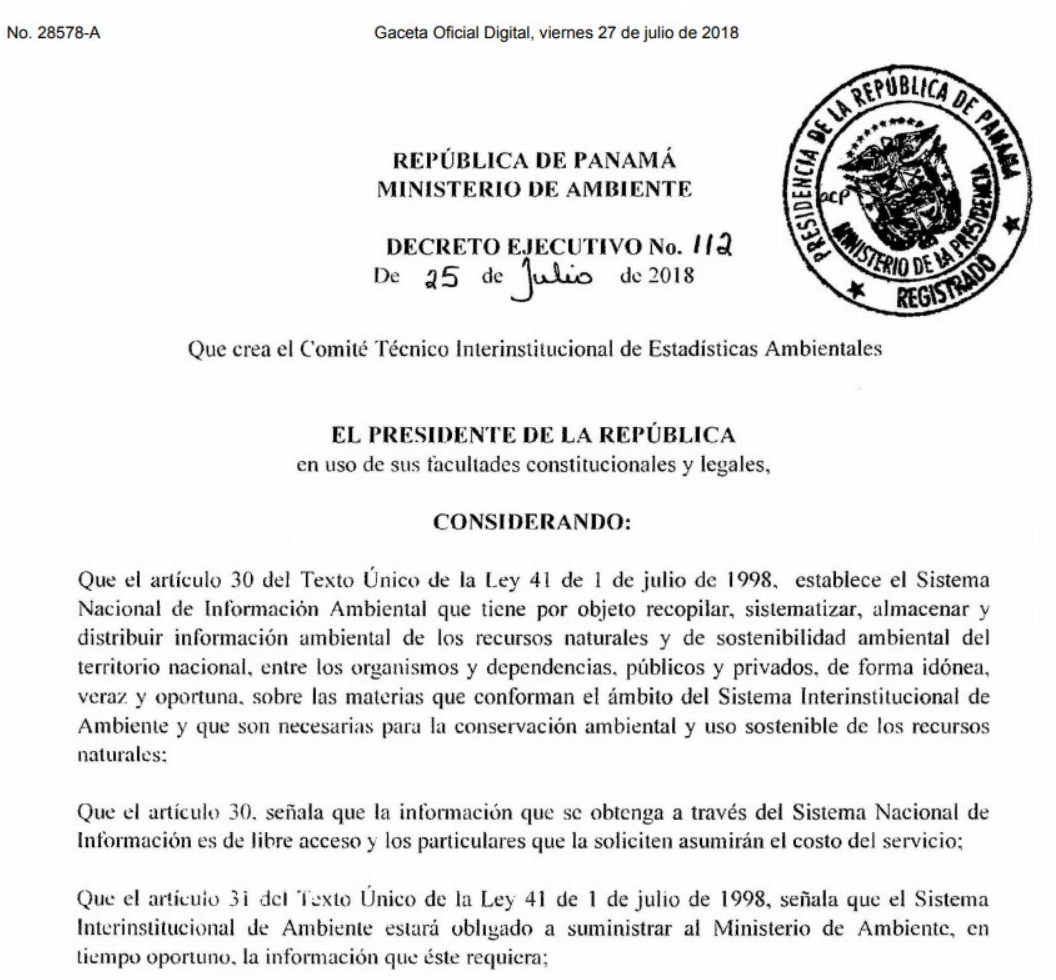




Fuente: United Nations University, ViE – SCYCLE, Bonn, Germany.

Inter-institutional coordination mechanisms in Latin America for environment statistics

- Presidential Decree 2018
- Co-chairs: NSO and Min Env
- 18 members: Ministries, companies, universities
- Thematic subgroups



No. 28578-A Gaceta Oficial Digital, viernes 27 de julio de 2018

REPÚBLICA DE PANAMÁ
MINISTERIO DE AMBIENTE

DECRETO EJECUTIVO No. 112
De 25 de Julio de 2018

PRESIDENCIA DE LA REPÚBLICA DE PANAMÁ
MINISTERIO DE LA PRESIDENCIA
REGISTRADO

Que crea el Comité Técnico Interinstitucional de Estadísticas Ambientales

EL PRESIDENTE DE LA REPÚBLICA
en uso de sus facultades constitucionales y legales,

CONSIDERANDO:

Que el artículo 30 del Texto Único de la Ley 41 de 1 de julio de 1998, establece el Sistema Nacional de Información Ambiental que tiene por objeto recopilar, sistematizar, almacenar y distribuir información ambiental de los recursos naturales y de sostenibilidad ambiental del territorio nacional, entre los organismos y dependencias, públicos y privados, de forma idónea, veraz y oportuna, sobre las materias que conforman el ámbito del Sistema Interinstitucional de Ambiente y que son necesarias para la conservación ambiental y uso sostenible de los recursos naturales;

Que el artículo 30, señala que la información que se obtenga a través del Sistema Nacional de Información es de libre acceso y los particulares que la soliciten asumirán el costo del servicio;

Que el artículo 31 del Texto Único de la Ley 41 de 1 de julio de 1998, señala que el Sistema Interinstitucional de Ambiente estará obligado a suministrar al Ministerio de Ambiente, en tiempo oportuno, la información que éste requiera;

Mexico

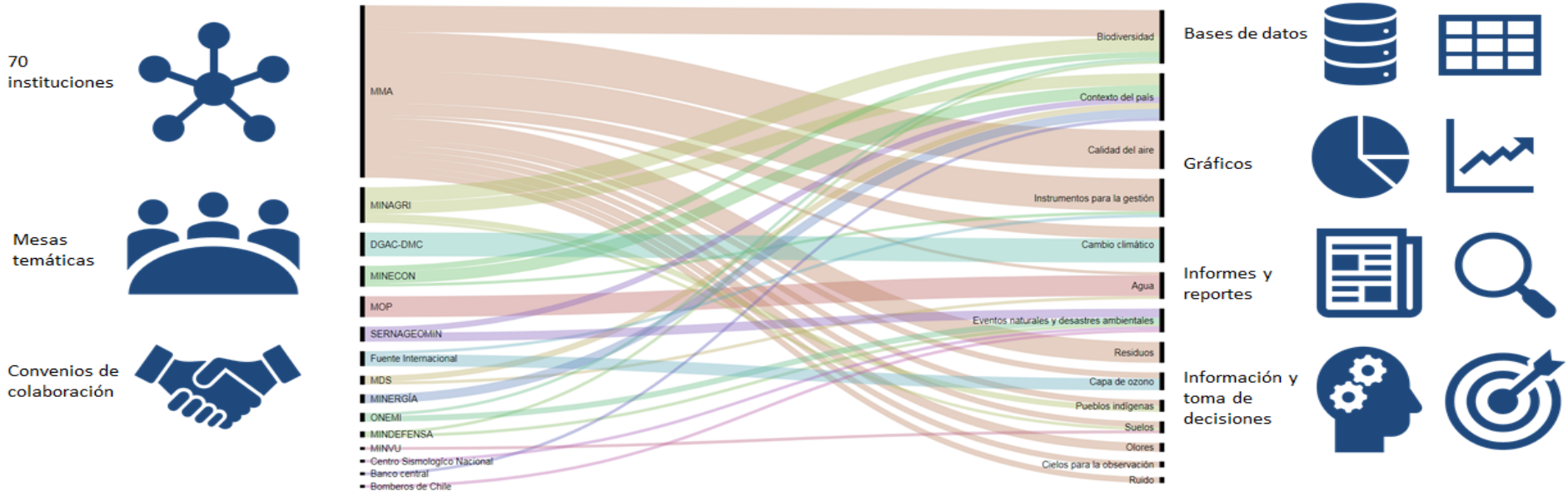
Ley del Sistema Nacional de Información Estadística y Geográfica

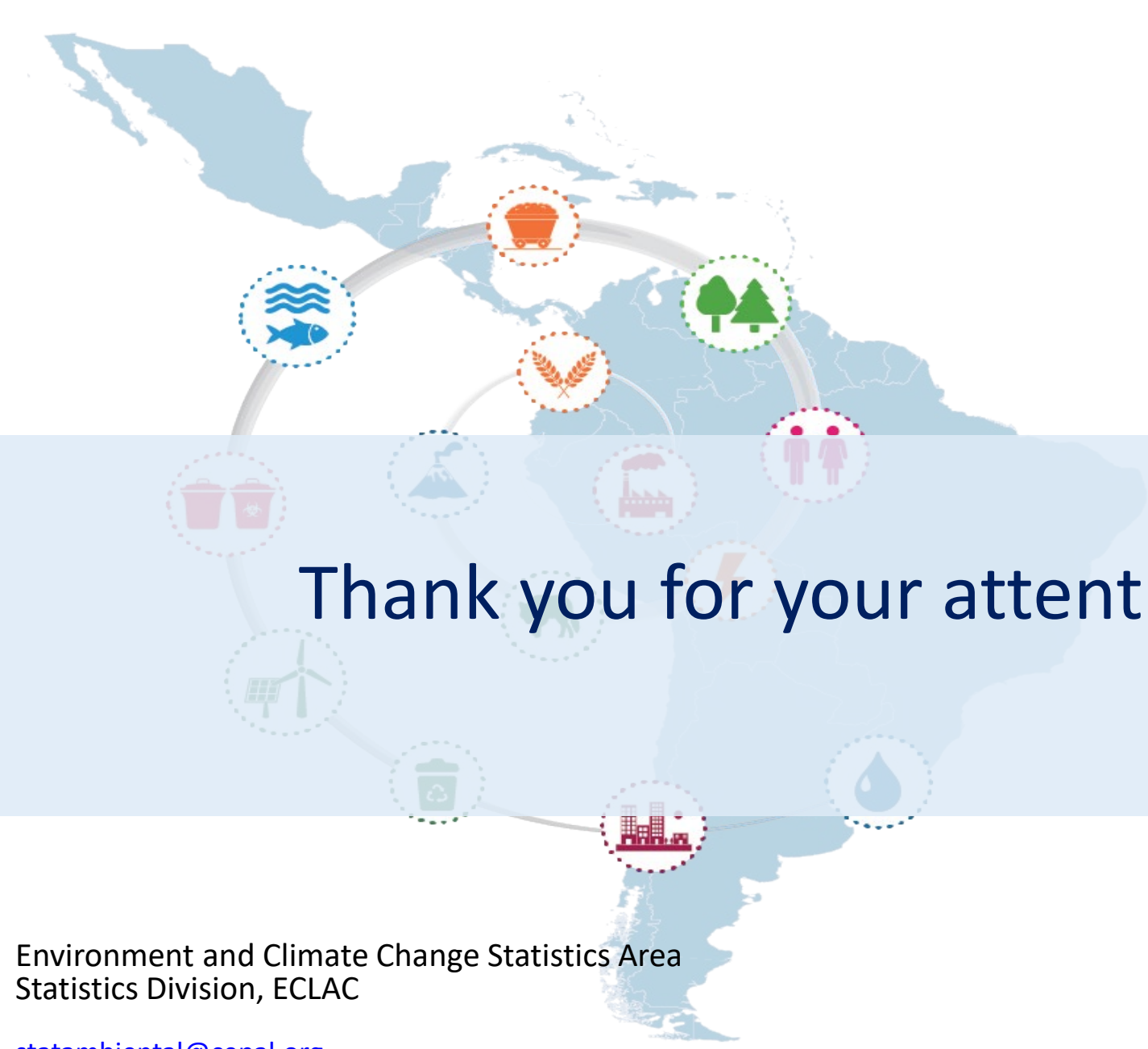
Chile

Comité Interinstitucional de Información Ambiental (RE 0179, 15-03-2012)

Comité Interinstitucional de Información Ambiental y Cuentas Ambientales (RE 0069, 02-02-2017)

Objetivo del Comité: Proveer y validar la información ambiental, requerida para dar cumplimiento a los deberes que en esta materia corresponden al Ministerio del Medio Ambiente debe realizar, de acuerdo con lo establecido en la Ley N°19.300, así como en los distintos Acuerdos, Convenios, y Tratados internacionales suscritos por el país en materia ambiental.





Expert Forum on Climate change-related statistics
3 – 4 October 2019, Geneva

Thank you for your attention

Environment and Climate Change Statistics Area
Statistics Division, ECLAC

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https://comunidades.cepal.org/estadisticas-ambientales/es

UNITED NATIONS

ECLAC