National workshop:

Generating climate change and disasters indicators for policy decision-making in Dominica

19 – 21 July 2022

From Data to Environment, Climate Change and Disaster Statistics

Janet Geoghagen, Environment and Climate Change Statistics Unit

Statistics Division / Climate change and environment statistics unit
Economic Commission for Latin America and the Caribbean (ECLAC)

Contents

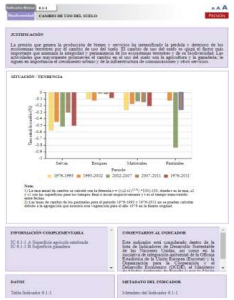
- Statistical processes
- Sources of data
- Stages of data production (example)
- Validation
- Metadata
- Demand for climate change and disasters statistics and indicators

Stages of statistical processing

Validation

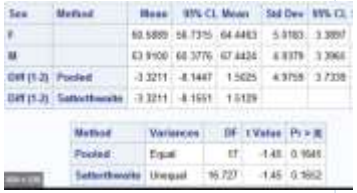
Data

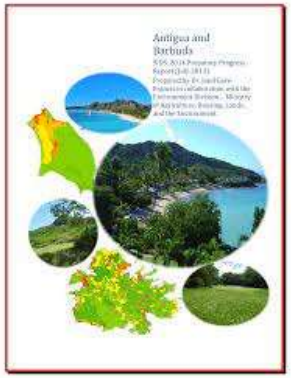
Structuring



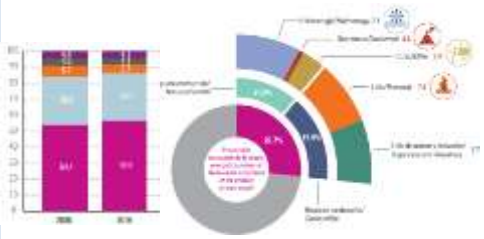
Description (metadata)

Statistical series (compendia, yearbooks and databases)





Selection and processing of statistics, aggregation and combination with economic and social statistics



Environment indicators

Users and uses of the indicators

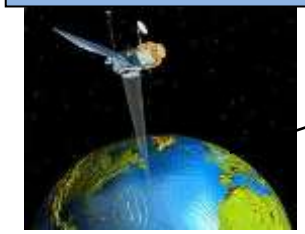
- SDG environment indicators
- Public policies and programmes
- State of the environment reports
- Environment performance reports
- Environment accounts

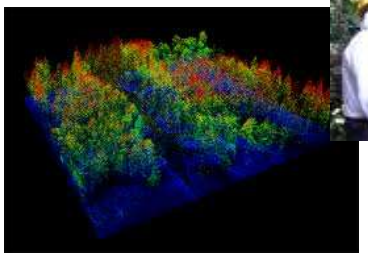
Main stages from data production to statistics and indicators

Example: from data production to forest statistics and indicators

Monitoring: Observation of forest extent, year *x*

Primary resources
Remote sensing
Satellite image
Ministry-Forest/ Agriculture Authority





Processing

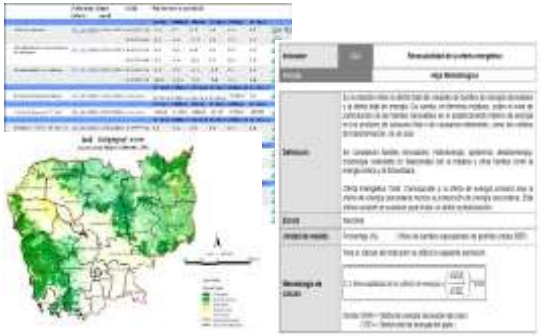
Specialized agency + NSO

Validation

Transforming primary data into statistical series

Forest inventory year *x*

Metadata construction



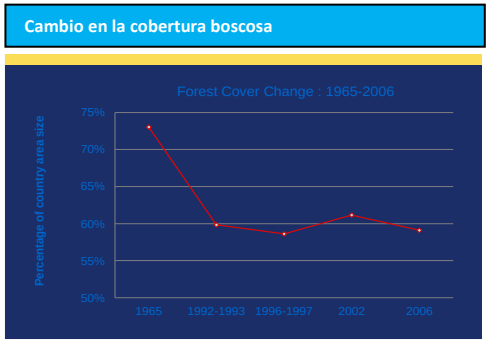
Production and Dissemination

Statistics:

Forest area (hectares)

Indicator:

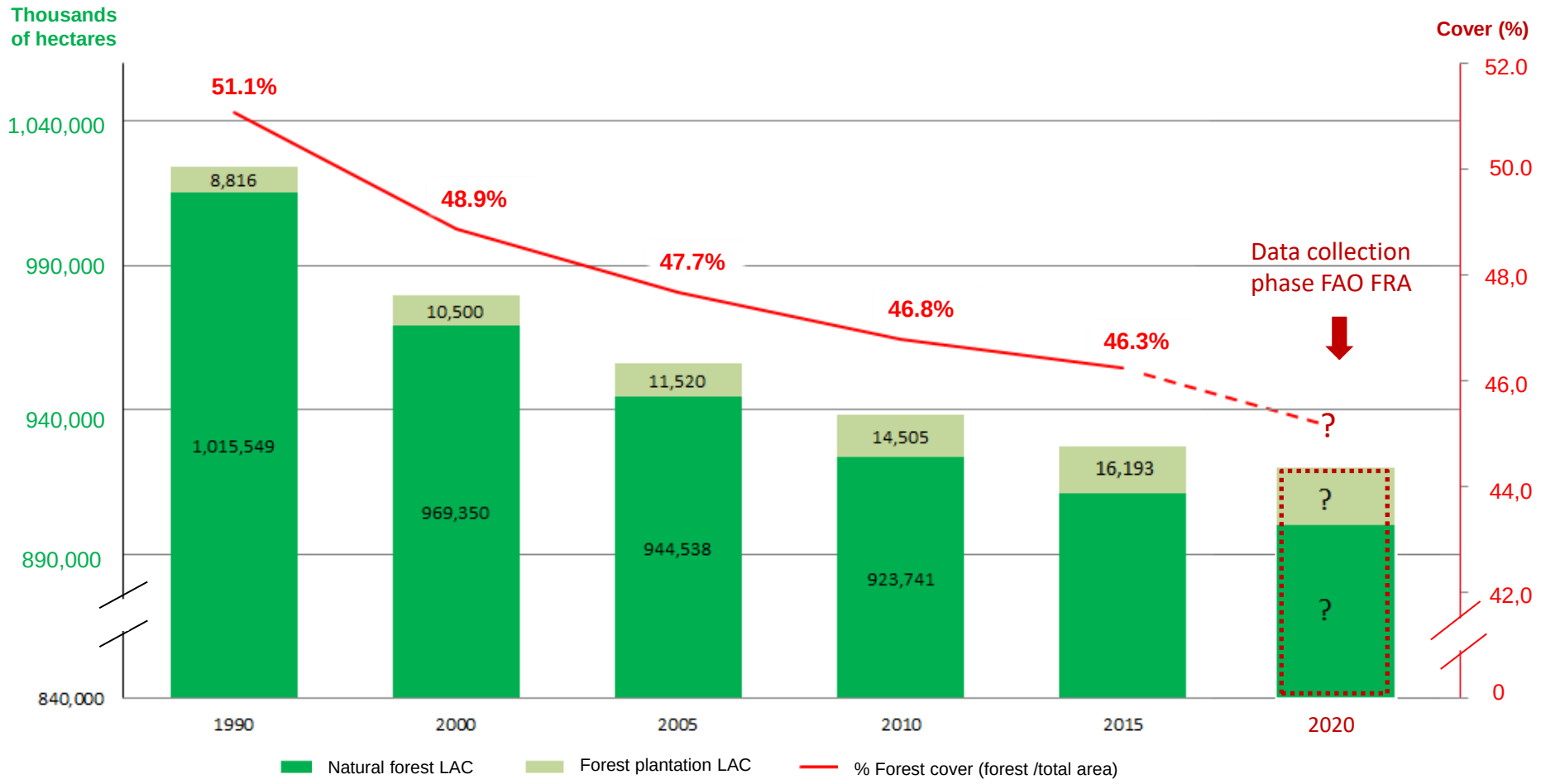
Forest cover of the territory (%)



Latin America and the Caribbean: Forest Cover, Natural Forest and Forest Plantation Areas 1990-2015

In thousands of hectares by forest type (bars) and percentage of forest cover of regional area

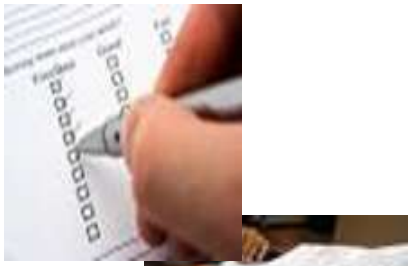
97 million hectares were lost, equivalent to more than the total area of **Venezuela.**



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

Sources of data

1. **Censuses** (population, housing, economic, agricultural, establishment)
2. **Surveys** (households, agriculture, enterprises, employment, economics, environmental)
3. **Administrative records** (of government ministries, departments and agencies, utility companies, authorities of related areas such as water, land, energy, forest, fisheries, education, health, budget, etc.)
4. **Remote sensing and thematic mapping** (satellite imagery, forests or land use and/or coverage, water pollution levels in lakes and lagoons)
5. **Monitoring systems** (field monitoring stations for water quality, precipitation, air pollution, climate, soils, etc.)
6. **Scientific research**, projects and studies.
7. **Estimation and modelling** (regressions, simulation, extrapolation and interpolation).





Validation of environment statistics

- Statistical process by which the data and microdata received are reviewed, consulted, refined for transformation into environment statistics and, if necessary, they should be corrected.

- To validate, there are several steps to be followed and different techniques and criteria used, according to the nature of the statistical variable, its type of source and the theme.

- Result of validation: statistically valid statistics series are constructed from the data.

- A technical data sheet on the data series (metadata) previously used is required. The base metadata is compared with the definitions, units and specifications of the data collected to verify comparability.

Steps towards environment statistics validation

- **General review** of series and observation points raised, compiled or reported.
- **Examination** of variations in the behaviour of the **variable** in terms of periodicity and area/volume.
- Confirmation of the **unit of measurement** (conversion if different from the required one).
- Careful **reading of source notes/metadata** and establishing possible differences between what is requested and what is reported.
- Attention to series **with jumps or unexplained trends** (methodological change, disaster, emergency), liaise with informant to document causes and results.
- **Checking the value** of the series with other similar and/or related variables that are previously published.
- If it is a one-off or first survey**, comparison of the value** of the series with other territories or countries, depending on similar characteristics or dimensions.
- **Analyse** regarding the knowledge about the environmental situation and sustainability of the development of the territory and temporal period in question.

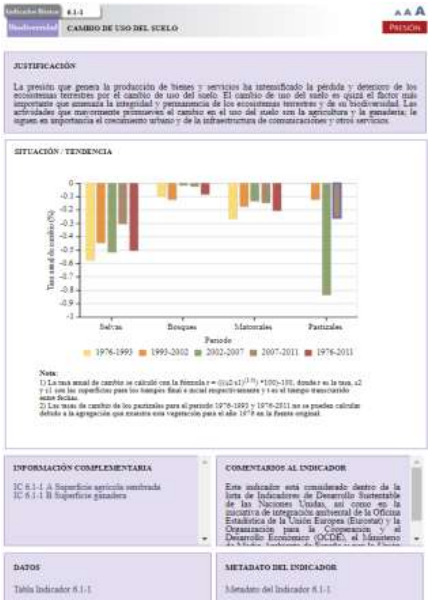
Description of environment statistics metadata

Metadata are information about information

- The metadata gives a comprehensive description of the definitions, units of measurement, methods of survey, method or formula of calculation, periodicity of survey and updating and other important details about each statistical series or indicator produced and disseminated.
- This information is recorded in methodological sheets or fact sheets.

Metadata allows:

- Proper understanding and interpretation of the environment statistics and indicators that are produced and disseminated.
- Producers to analyse in detail how the statistical and indicator series have been produced, in order to continue to produce them in a comparable way temporally and spatially today and in the future technical tables and charts.



International statistical guides and recommendations

Examples of guides and recommendations are:

- For the collection, production and dissemination of environment statistics in general in the FDES: **https://unstats.un.org/unsd/envstats/fdes.cshtml**

- For definitions, survey methods, main institutional actors, production of environment statistics on specific topics contained in the FDES, e.g., statistics on water, energy, ecosystems and biodiversity, forests, agriculture, disasters, climate change, waste, environmental management, human settlements, air quality, water and soils, among others, are offered as chapters of the Manual of the Basic Set of Environment Statistics: **https://unstats.un.org/unsd/envstats/fdes/manual_bses.cshtml**

- For information on UNSD climate change statistics: **https://unstats.un.org/unsd/envstats/climatechange.cshtml**

Climate change data demands

Increased Demand for Climate Change-related Statistics

- Climate change poses considerable challenges to statistical metrics, both for Member-States and UN entities.
- The statistical community faces a growing demand for statistics and data from various stakeholders:

National Climate Change Public Policies →

- **Emissions, Impact, Adaptation, Mitigation.**
- **Need to develop and strengthen capacities to describe climate change statistically**
- **Nationally Determined Contributions (NDCs)**

Sustainable Development Goals →

- **Goal 13: Take urgent action to combat climate change and its effects.**
- **Goals 6, 7, 11, 14, 15 include climate-related targets.**

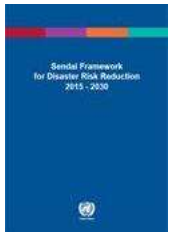
Paris Agreement →

- **Reduction of emissions**
- **Temperature increase under 2 °C (compared to pre-industrial era)**
- **Mobilisation of resources for adaptation**
- **Less carbon-intensive economies**

Disasters data demands

Increased Demand for Disaster-related Statistics

- Climate-related and other extreme events create hardships for countries and their population.
- The demand for reliable data is increasing among stakeholders:



SENDAI Framework →

- Understand disaster risk;
- Strengthen governance to manage disaster risk;
- Invest in disaster reduction for resilience;
- Enhance disaster preparedness.

Sustainable Development Goals **1**, **11** and **13**

→ **Target 1.5**: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters

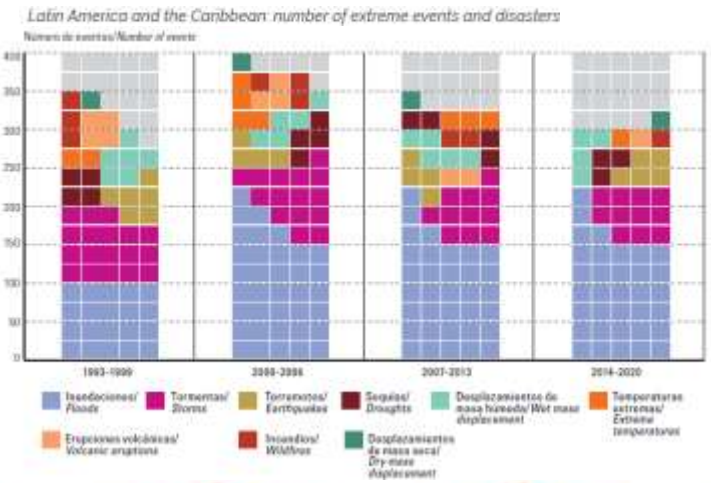
→ **Target 11.5:** By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

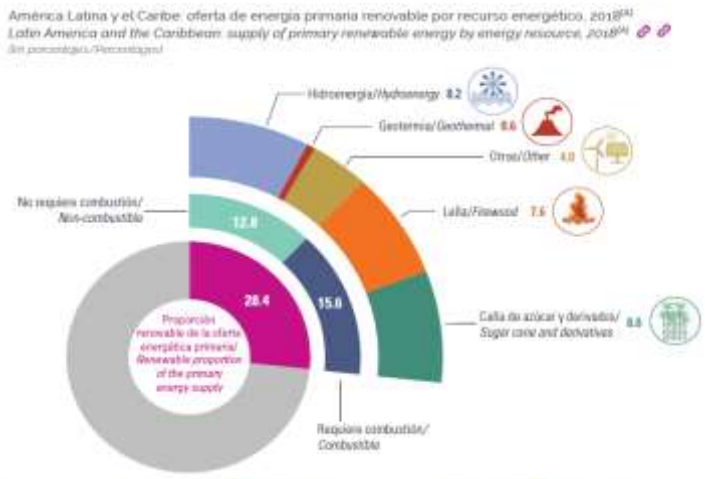
→ **Target 13.1:** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

Need for environment, climate change and disasters statistics in the Caribbean

- Indicators that require environment, climate change and disaster statistics to be compiled:
  - Of SDG targets and goals almost **70%** and **50%** of SDG indicators
  - Of SENDAI Framework: **100%** of indicators
  - Of Paris 2015 Agreement on Climate Change: **100%**
- There is an ever-growing **demand** from **international and national agreements and development plans and policy targets.**
- Of the three pillars of sustainable development, the newer and weakest is monitoring/measuring **environment, climate change and disasters.**

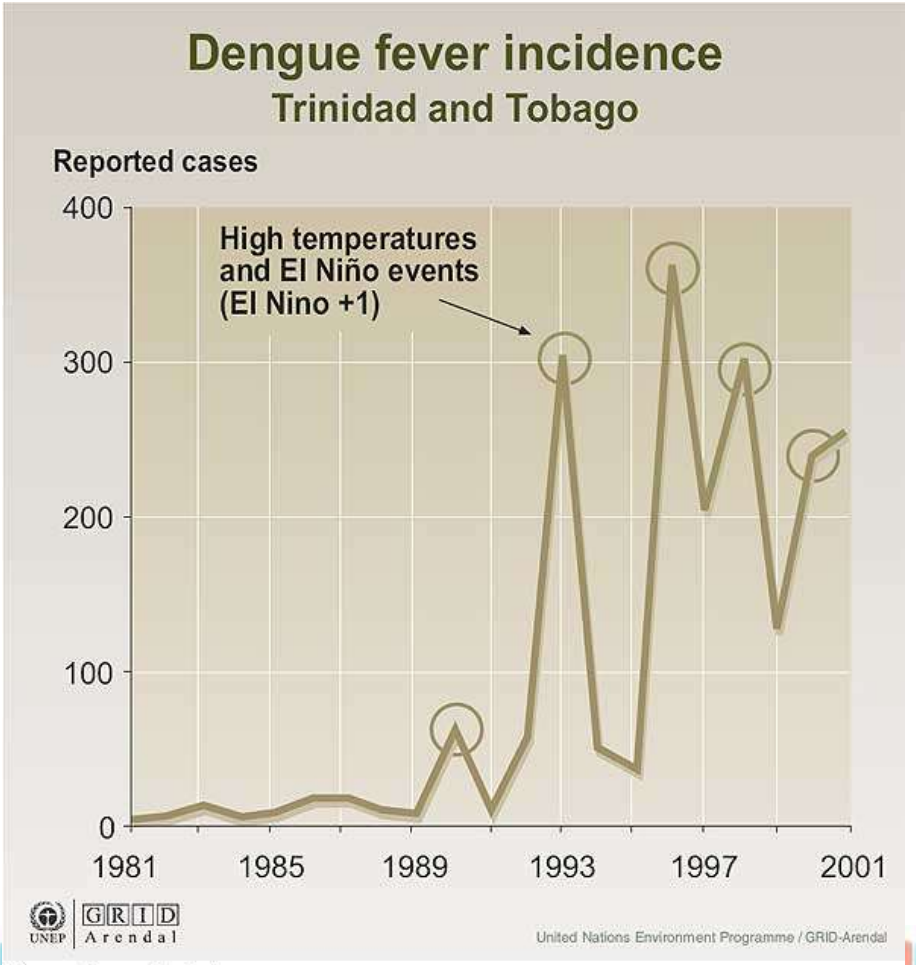
*What is **not measured, cannot be properly managed or solved.***





Likely regional impacts: Health

Key risks	Climatic factors
Spread of vector-borne diseases (e.g., dengue fever, zika) to other altitudes and latitudes.	• Upward trend in temperature • Temperature extremes • Precipitation extremes

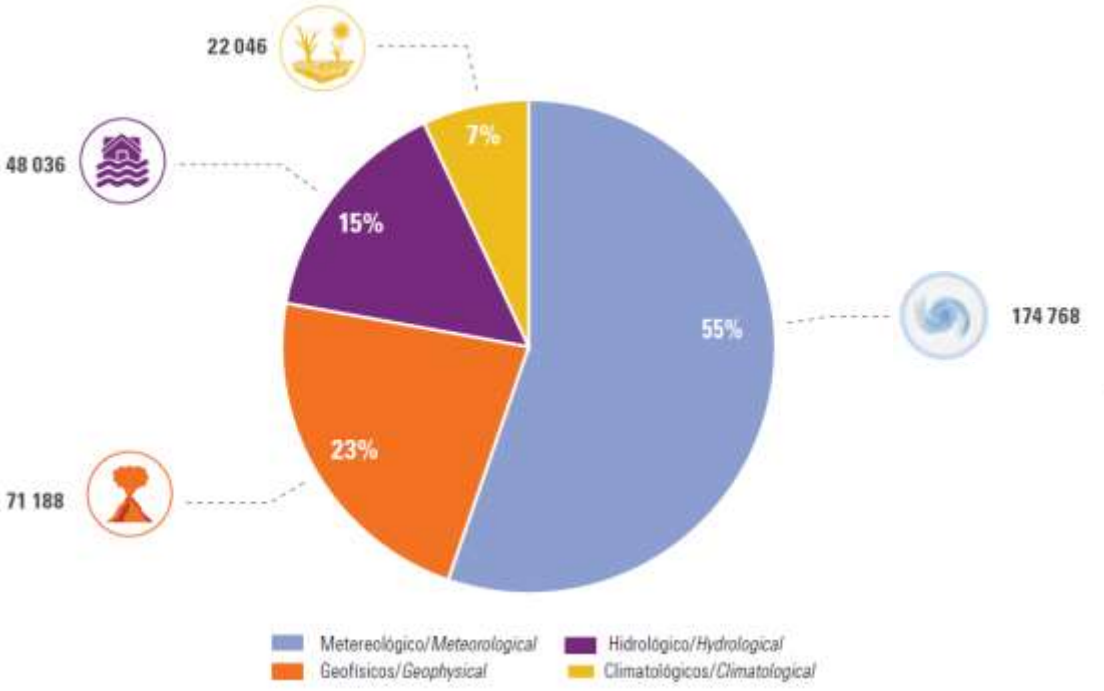


Source: Source Needed

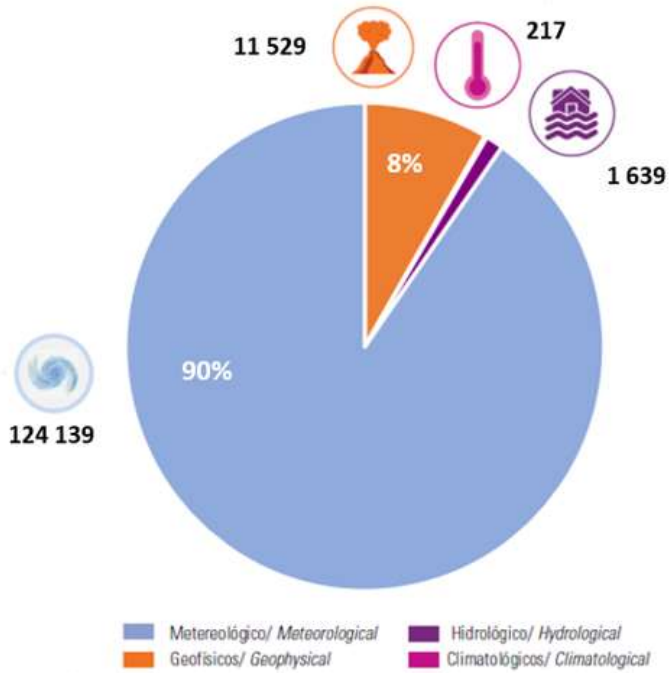
Evidence: LAC: Economic cost of disasters by type, 1970–2020

(En millones de dólares y porcentajes/Millons of dollars and percentages)

Latin America and the Caribbean



The Caribbean



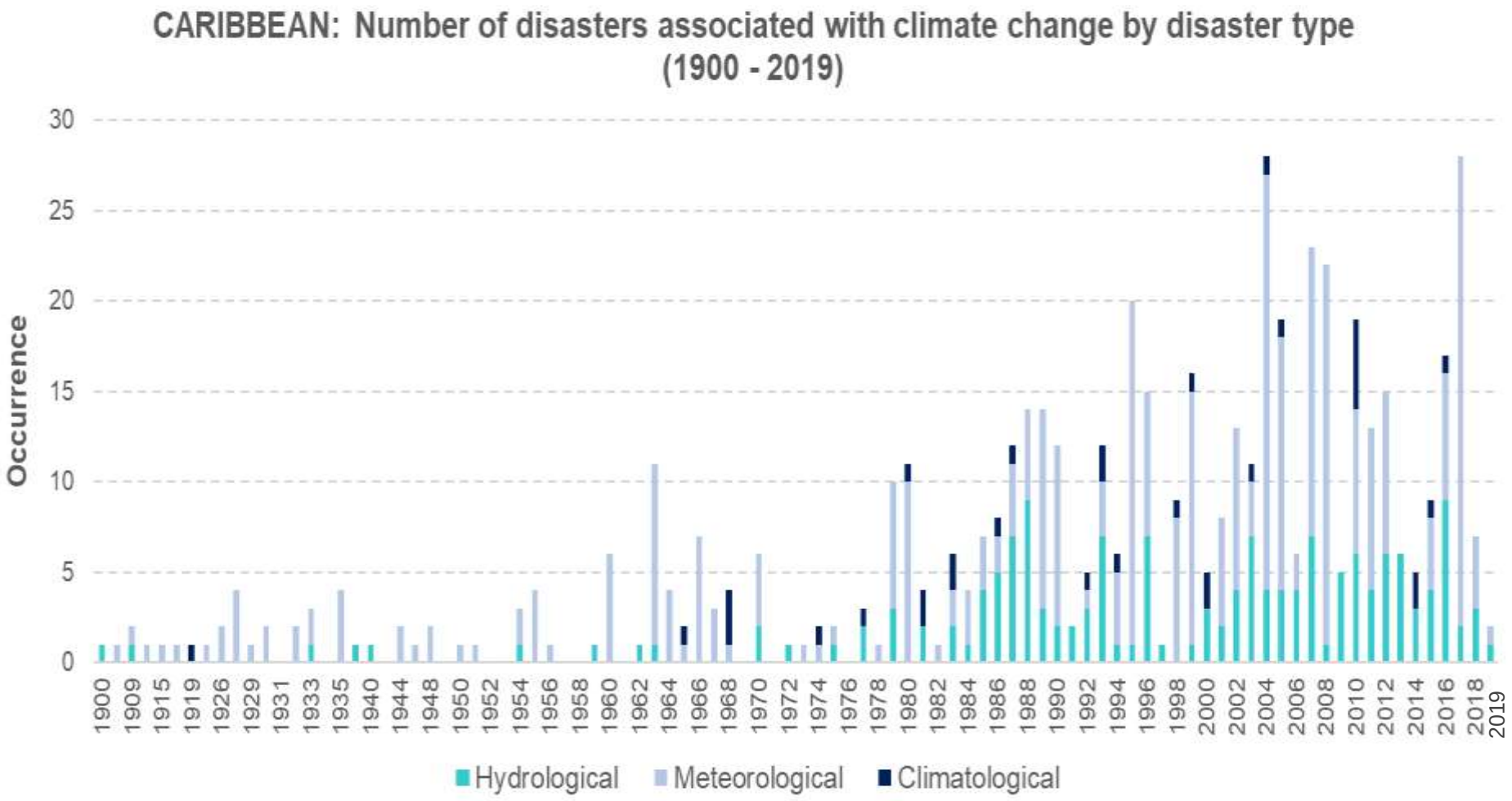
These damages and losses are only part of the story, as most disaster reports submitted to EM-DAT (63%) do not contain economic data.

NOTE: The VALUE of all damages and economic losses directly or indirectly related to disasters in the last 5 decades amounts to 323 billion dollars, this represents more than 4 times the GDP of the entire Caribbean for the year 2019

[A] Centro de Investigaciones sobre la Epidemiología de los Desastres (CRED), Base de Datos Internacional sobre Desastres (EM-DAT) [en línea] http://www.emdat.be/.

[A] Centre for Research on the Epidemiology of Disasters (CRED), International Disaster Database (EM-DAT) [online] http://www.emdat.be.

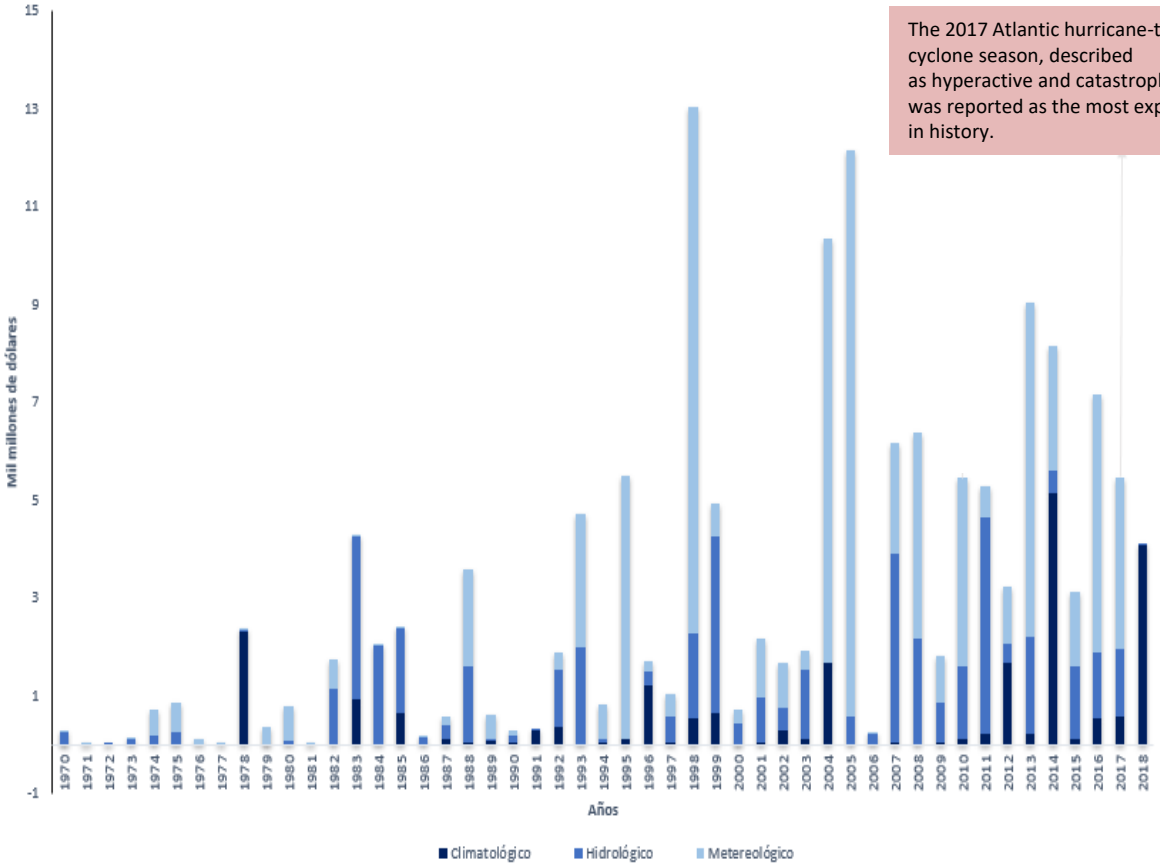
Caribbean: Number of Disasters Associated with Climate Change by Type of Disaster, 1900–2019



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

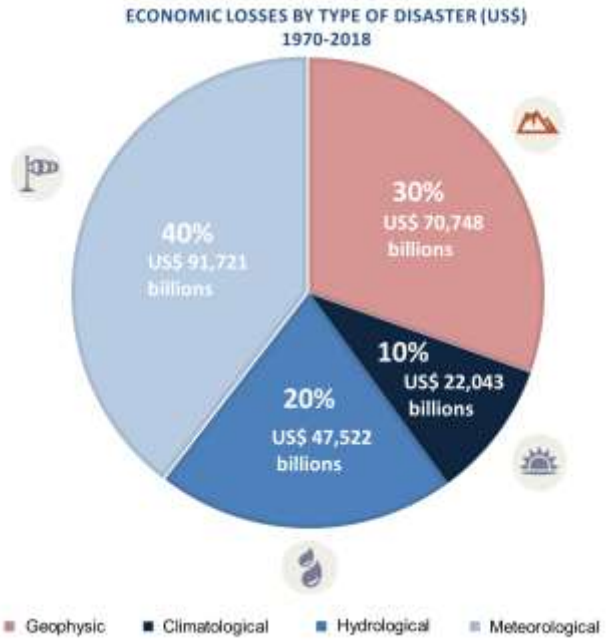
LAC: Economic cost of disasters associated with climate change, 1970–2018

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



The 2017 Atlantic hurricane-tropical cyclone season, described as hyperactive and catastrophic, 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 five 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

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Thank you for your attention!

https://www.cepal.org/en/topics/environmental-statistics

UNITED NATIONS

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