1.3.2 Preparing for adaptation with Earth observations in the LAC region

PARALLEL SESSION: TRANSFORMATIONS IN APPROACHES, THEMES AND SYSTEMS

27 March 2023

14:00 – 15:30

GEO GROUP ON EARTH OBSERVATIONS

NAPEXPO CHILE 2023

Sara Venturini, GEO Secretariat

Sara Venturini is the Climate Coordinator at the Group on Earth Observations (GEO) Secretariat.

At GEO she promotes access and the use of Earth observation data and solutions to inform and accelerate climate action by member countries.

She has 15 years' professional experience collaborating with UN agencies and advising governments and organisations around the world on developing and implementing climate change policies, and participating in multilateral climate negotiations.

She holds a PhD in Climate Change Science and Management from Ca’ Foscari University of Venice, Italy.

Katia Kontar, USGCRP AmeriGEO

Dr. Yekaterina "Katia" Kontar is affiliated with AmeriGEO.

She serves as the International Lead at the U.S.Global Change Research Program (USGCRP). She coordinates USGCRP interagency activities to promote international cooperation on global change research. Katia's research background and expertise lie in the fields of natural hazards and risk reduction and Arctic resilience.

GEO: the single largest global partnership focused on Earth observations for impact

GEO in numbers

7

CONTINENTS

114

COUNTRIES

144

PARTICIPATING ORGANIZATIONS

19

ASSOCIATES

GEO in numbers

20

YEARS

40

WORK PROGRAMME ACTIVITIES

7,000

DATA PROVIDERS

400,000,000

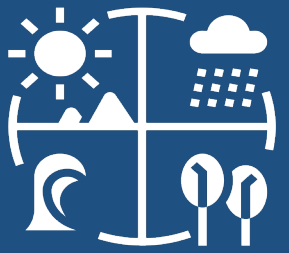
EARTH OBSERVATIONS

Focus Areas

GEO works to improve the availability, access, understanding and use of Earth observations for the benefit of society.

Sustainable Development

Climate Action



Disaster Risk Reduction

Urban Resilience

Evidence-based activities to support policy

GLOBAL POLICY

Earth observations for climate action under the UNFCCC. Disaster risk reduction under Sendai Framework. Land degradation neutrality with UNCCD. Nature-based solutions with CBD. Mercury monitoring under Minamata Convention for Mercury.

NATIONAL IMPLEMENTATION

Capacity development and projects. Agriculture monitoring for adaptation, flood early warning systems, impact of wildfires, coastal areas and ocean health, etc. Supplementary Technical Guidance to integrated Earth observations into National Adaptation Plans (NAPs).

Regional

AfriGEO provides a framework for African countries and organizations to access, leverage and coordinate Earth observation initiatives, creating synergies and minimizing duplication for the benefit of the continent.

The AmeriGEO community promotes cooperation among the GEO members in region. Focused on capacity building to support priority areas, this network is contributing to local, regional and national activities.

AOGEO coordinates activities in the Asia Oceania region with the aim to strengthen regional activities, support GEO's Foundational Tasks and deliver Integrated Priority Studies for the region.

EuroGEO improves coordination among the members from Europe with a regional framework to promote the use of Earth observation data to improve the lives of citizens and guide evidence based decisions.

Agenda

Presentations (60 min) with a focus on Earth observations and the LAC region

- Jonathan Hodge, Programme Director, CSIRO Chile / GEO Blue Planet
- Carolina Adler, Executive Director Mountain Research Initiative / GEO Mountains
- Karina Barrera, Undersecretary of Climate Change, Ministry of Environment, Water and Ecological transition (MAATE), Ecuador
- Rosa Ana Gonzalez, Adaptation Specialist, Ministry of Environment, Water and Ecological transition (MAATE), Ecuador
- Andria Rosado, Data Manager, Coastal Zone Management Authority & Institute, Belize
- Natalia Bermudez, NASA Servir / AmeriGEO
- Virginia Burkett, Chief Scientist for Climate and Land Use Change, International Programs at the United States Geological Survey (USGS) / AmeriGEO

Q&A and open discussion (30 min)

Jonathan Hodge, GEO Blue Planet CSIRO Chile

Jonathan has over 20 years of experience working in government and research sectors, specialising in the use of environmental information in decision-making. His work focuses on helping to improve how data is used and understood through the use of modern information and technology solutions.

Jonathan is a Program Director in the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Santiago office and is a member of the GEO Blue Planet Steering Committee.

Introduction to Earth observations for adaptation

Jonathan Hodge,
GEO Blue Planet
CSIRO Chile

Content

- Introduction to earth observations (EO)
- EO examples
- Role of EO in climate monitoring, mitigation and adaptation

Earth observations

Earth observations are data and information collected about our planet, whether relating to the atmosphere, oceans or land.

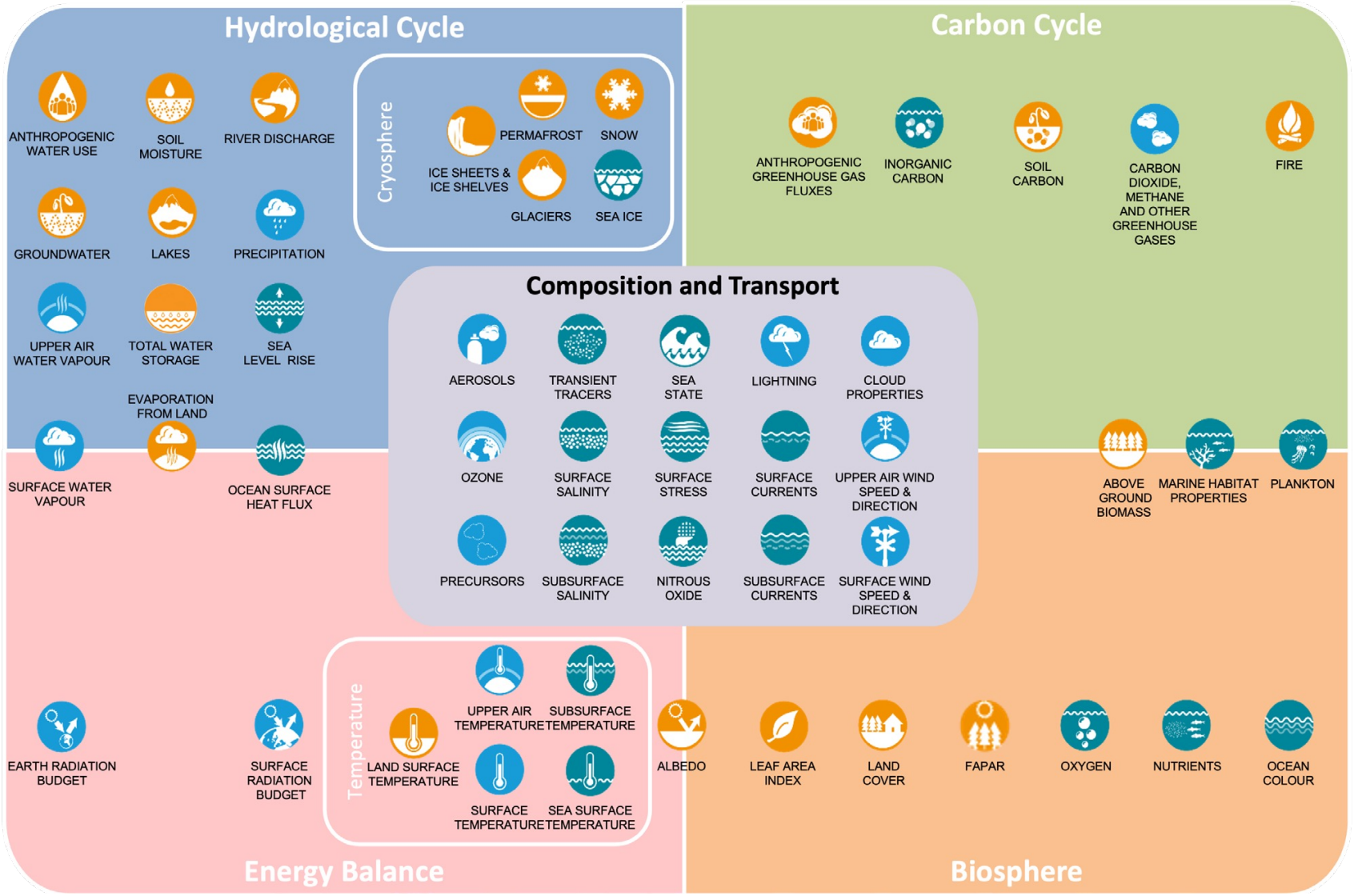
This includes satellite imagery, space-based or remotely-sensed data, as well as ground-based or in situ data - sensors in, on or around the Earth.

Earth Observation and Geospatial Information Resources for SDG Monitoring

From: **Geospatial Information and Earth Observations: Supporting Official Statistics in Monitoring the SDGs** (March, 2016). Credit: GEO

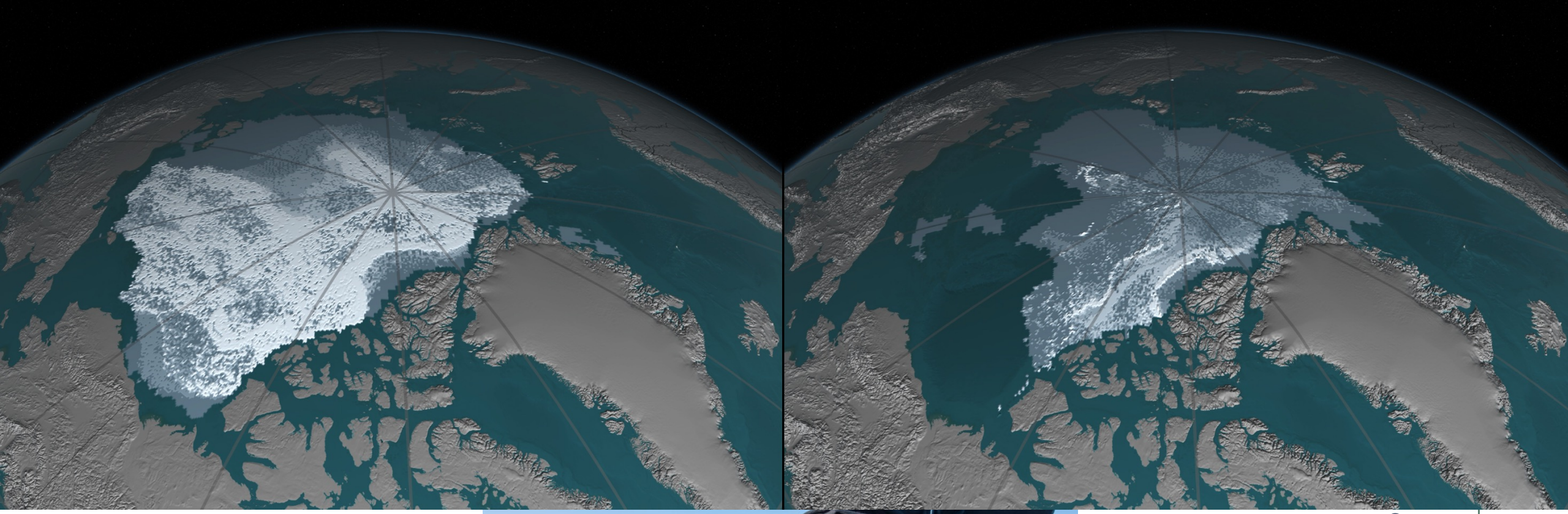
https://www.earthobservations.org/documents/meetings/201603_eo_sdgs_ny/2016_geo_un_flyer.pdf

EO and Essential Climate Variables



- Atmosphere ECVs
- Ocean ECVs
- Terrestrial ECVs

Source: Global Climate Observing System (https://gcos.wmo.int/)

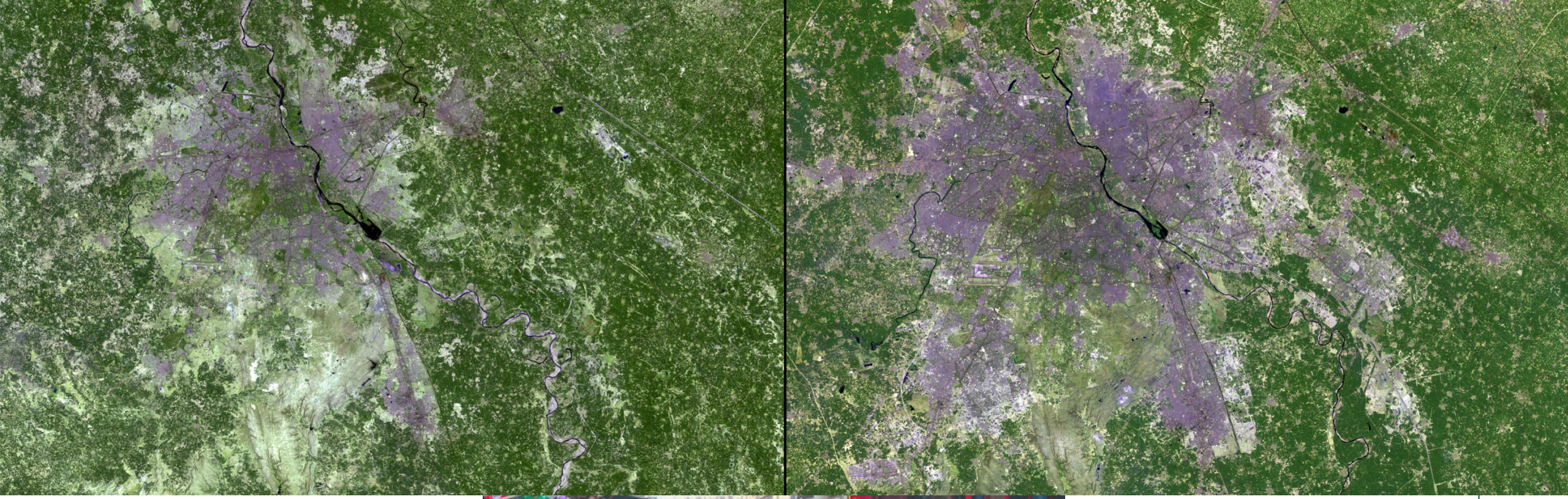


Arctic sea ice decline

Source:
NASA Images of Change

Deforestation in Ghana

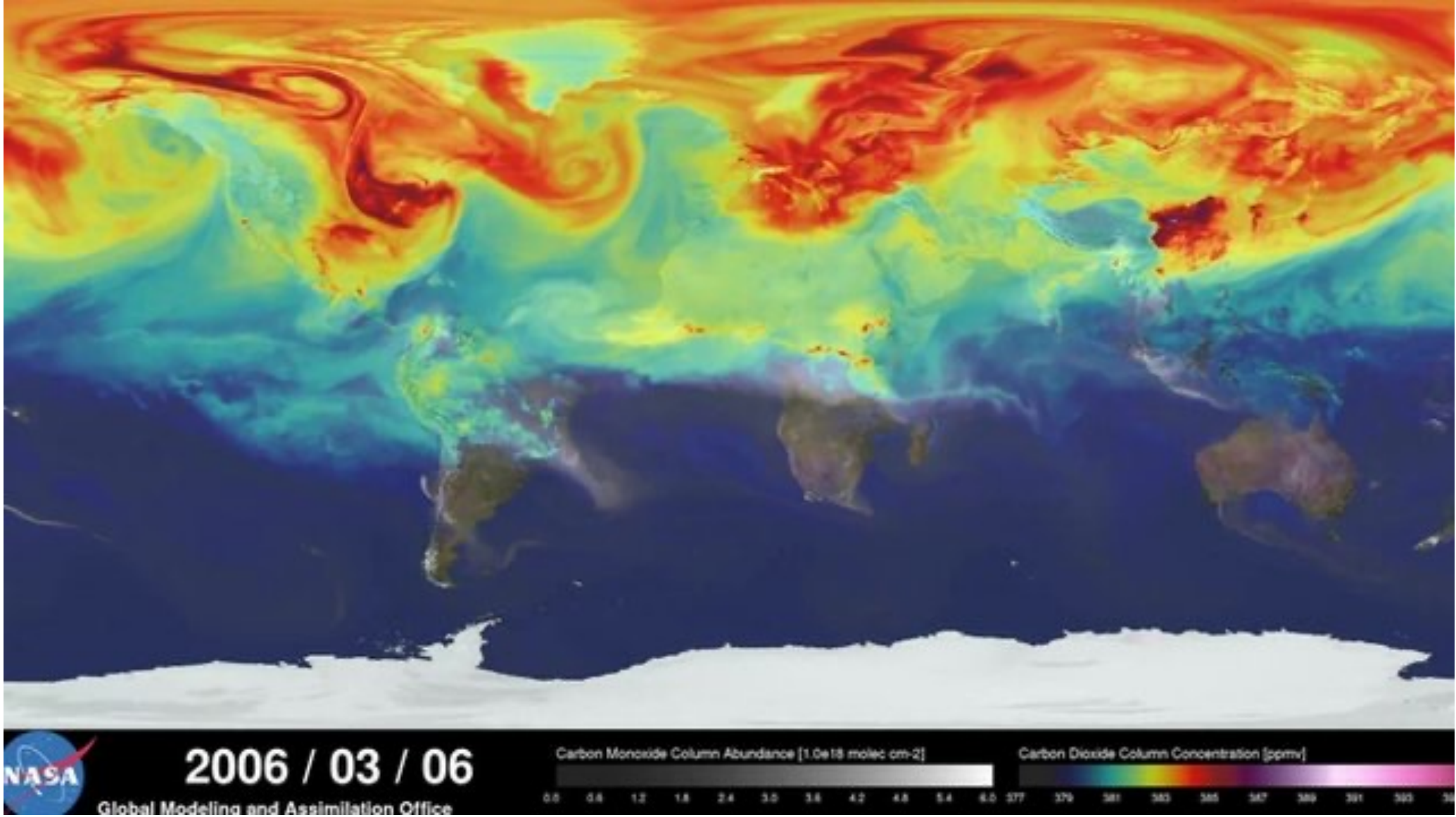
Source:
Sentinel-2 GeoMAD



Urban expansion in India

Source:
NASA Images of Change

GHG emissions and fluxes



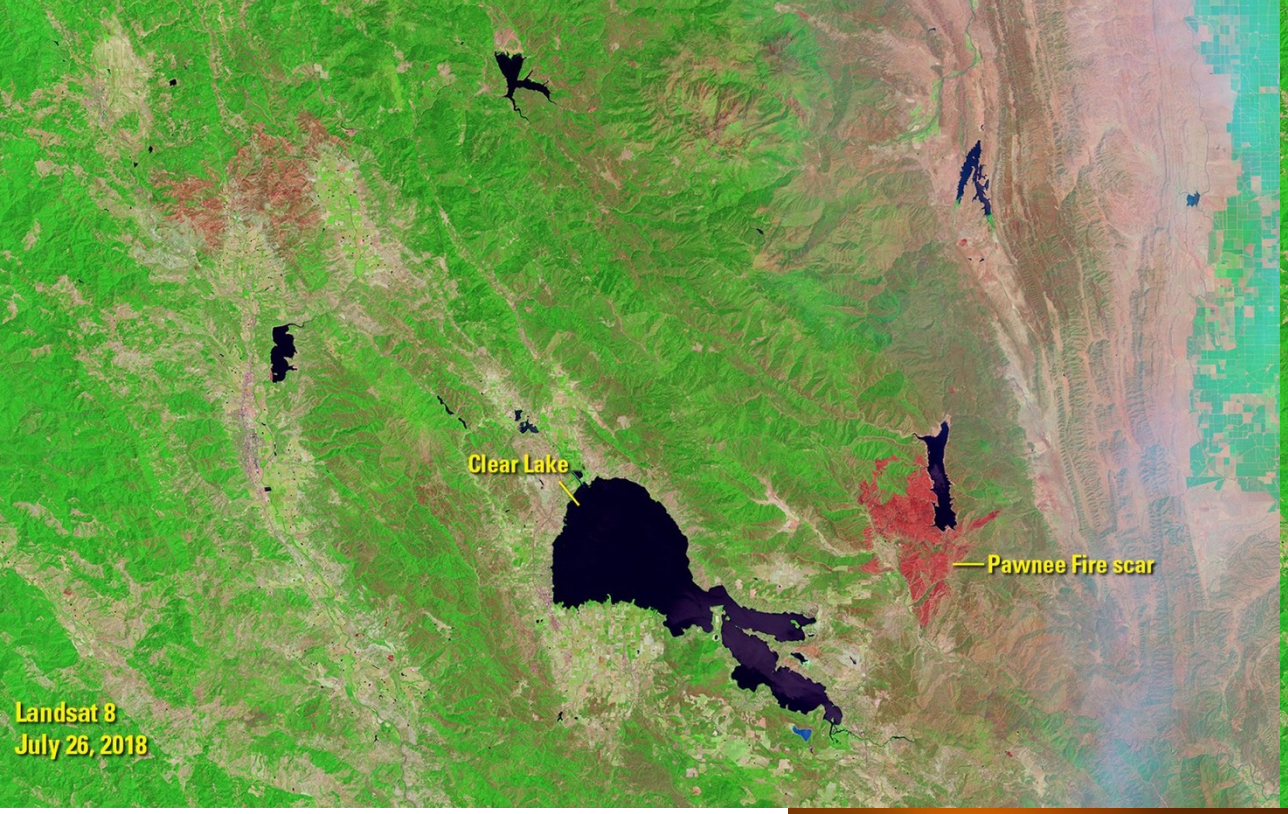
Satellite observations and atmospheric models working together to visualise CO2 emissions

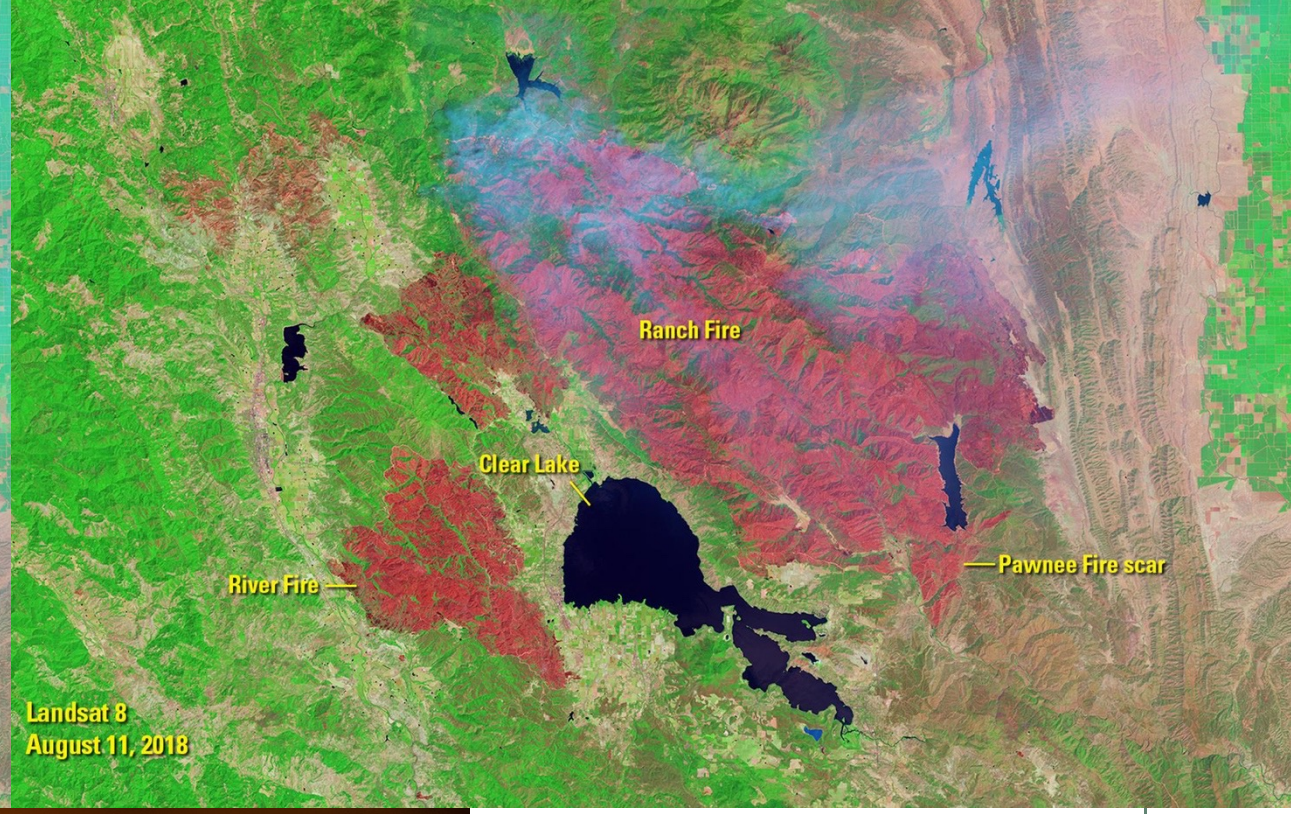
Source: NASA Goddard

NASA | A Year in the Life of Earth's CO2 - YouTube

Lake drought in Bolivia

Source:
NASA Images of Change



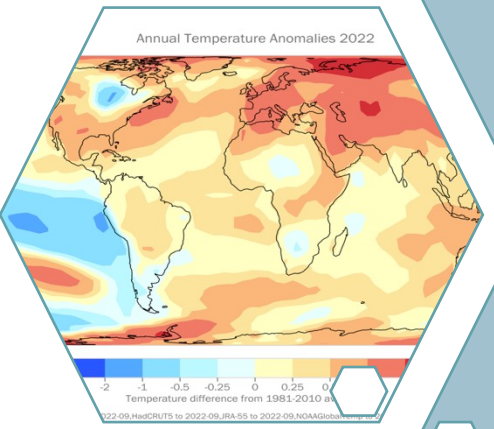


Wildfires in California

Source:
NASA Images of Change

Role of Earth Observations

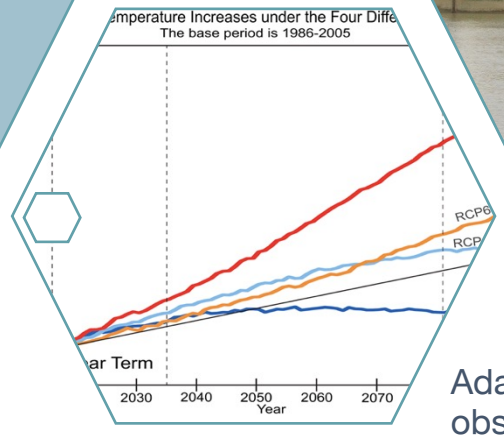
Sinks & Reservoirs



Climate state

Mitigation

Adaptation

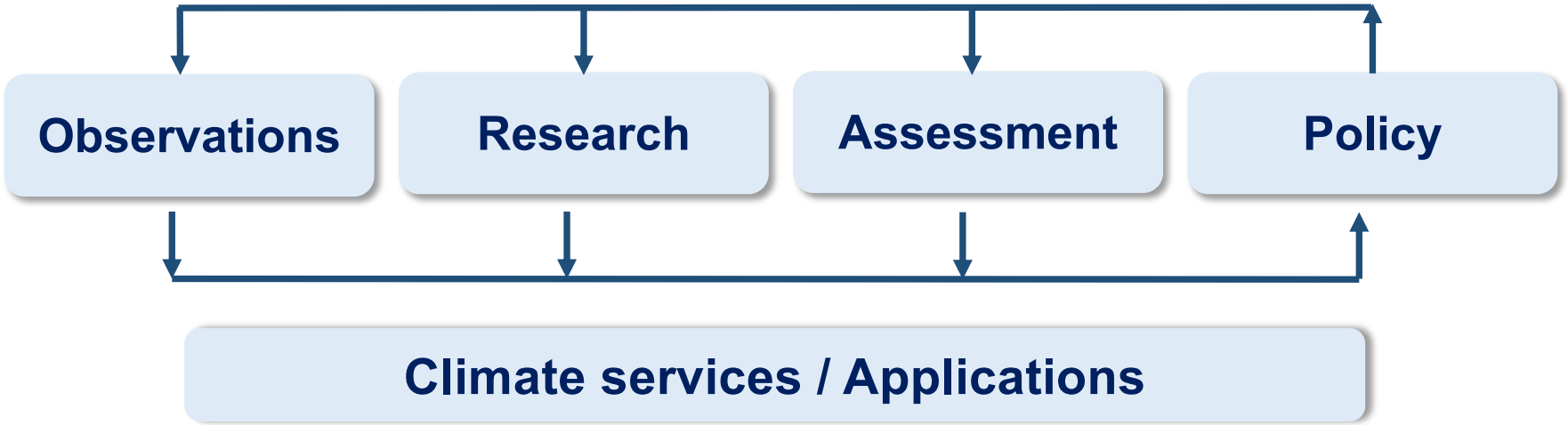


Loss & Damage

Adapted from: Hegglin et al. (2022) Space-based Earth observation in support of the UNFCCC Paris Agreement https://doi.org/10.3389/fenvs.2022.941490

Role of Earth Observations

At the foundation of international climate policy



Article 4: Commitments

Article 5: Research and Systematic Observation

United Nations
Framework Convention on
Climate Change

Adapted from UNFCCC Secretariat, 2020

Contacts

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#NAPExpo #EO4Impact

@GEOSEC2025

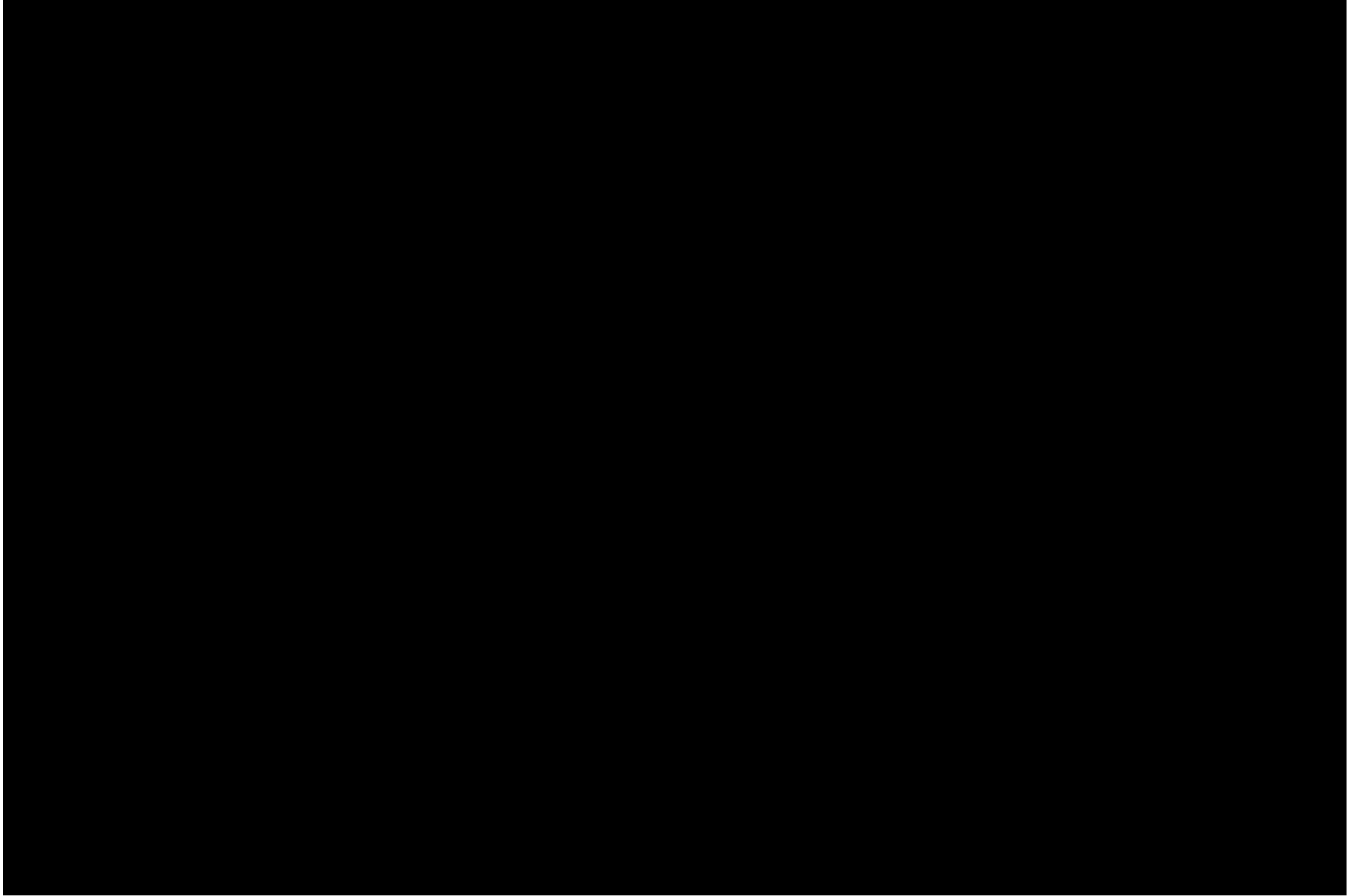
GROUP ON EARTH OBSERVATIONS

NAPEXPO CHILE 2023

Carolina Adler, GEO Mountains MRI

Carolina Adler is an Environmental Scientist and Geographer. Her international career spans over 25 years in both research and practice in the public and private sectors. As the current Executive Director of the Mountain Research Initiative (MRI), she is the main coordinator of an international network of leading mountain experts, and works to promote regional and thematic research on global change in mountains.

She is a Lead Author for the IPCC sixth assessment, specifically for the chapter on High Mountain Areas of the Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC), published in September 2019. She is also a member of the IPCC Working Group II on Impacts, Vulnerability, and Adaptation and Co-Lead for the Cross-Chapter Paper on Mountains, published in February 2022.



Karina Barrera, Ministry of Environment, Water and Ecological Transition (MAATE), Ecuador

A Chemical Engineer, with a Master's Degree in Environmental Management and another in Business Administration with a specialization in Policy and Strategy. Diploma in Finance and Groundwater Management. She has 20 years of experience formulating, directing and executing Environmental, Circular Economy and Sustainable Development Projects in the public and private sectors and from civil society.

She has held public positions as Advisor to the Ministerial Office of the Ministry of the Environment, where she has participated in international negotiations and in the formulation of Public Policy.

She currently works as Undersecretary of Climate Change of the Ministry of the Environment, Water and Ecological Transition.

Rosa Ana Gonzalez, Ministry of Environment, Water and Ecological Transition (MAATE), Ecuador

Climate Change Adaptation Specialist, Geographical and Environmental Engineer with a master's in integrated management of water Resources. Specialization in Climate Change and Gender, and with a Diploma in climate financing.

She has represented the country in negotiations of the Climate Change Convention on Losses and Damages, in the Intergovernmental Panel on Climate Change (IPCC), the Desertification Convention (CNULD) and the Ibero-American Network of Climate Change Offices (RIOCC). She led the formulation process of the National Adaptation Plan. She currently coordinates the CBIT Ecuador Project, to implement the Ecuadorian Transparency Framework.

Earth observations as key input for planning and implementing adaptation solutions to climate change in Ecuador

Rosa Ana Gonzalez,
Adaptation Specialist,
Ministry of Environment,
Water and Ecological
transition (MAATE),
Ecuador

Content

- **Definition of the Ecuador NAP**
- **Content**
- **Results**
  - Future global climate change scenarios
  - Results of climate projections of Ecuador
  - Results of oceanic projections of Ecuador
  - Climate Risk and Adaptation
  - GEOGLoWS in Ecuador
- **Information system, projections, climate risk and adaptation to climate change**
- **Next Steps**

PNA

PLAN NACIONAL DE ADAPTACIÓN

E C U A D O R

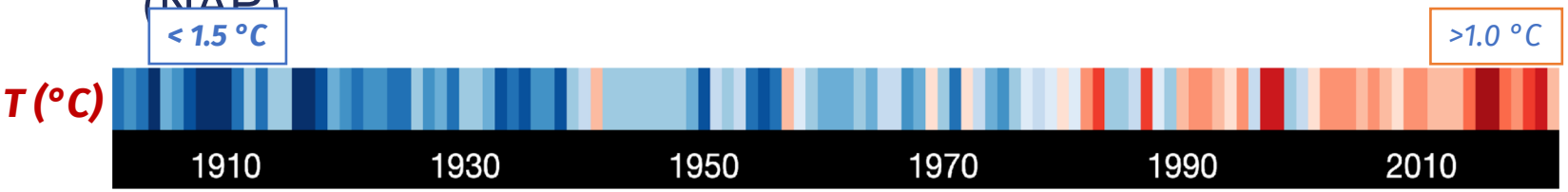
The first National Adaptation Plan (NAP) for Ecuador

Ministerio del Ambiente, Agua y Transición Ecológica

Gobierno del Ecuador

GUILLERMO LASSO
PRESIDENTE

What is the National Adaptation Plan (NAP)



Ecuador presents a very high risk facing the adverse effects of climate change.

PNA
PLAN NACIONAL DE ADAPTACIÓN
E C U A D O R

The National Adaptation Plan towards Climate Change is a management instrument that responds to the high climate risk in Ecuador and it is protected by law, State policies as well as international agreements.

General Objective

To contribute to the integration of adaptation to climate change in a national, local and sectoral development planning; as well as the identification and reduction of current and future climate risk of social, economic and environmental systems that are vulnerable to the effects of climate change.

Nacional Policies

- National Strategy towards Climate Change
- Organic Environmental Code and its Regulations

Internacional Policies

- CMNUCC Convención Marco de las Naciones Unidas sobre el Cambio Climático
- COP16 México 2010
- PARIS2015 UN CLIMATE CHANGE CONFERENCE COP21·CMP11

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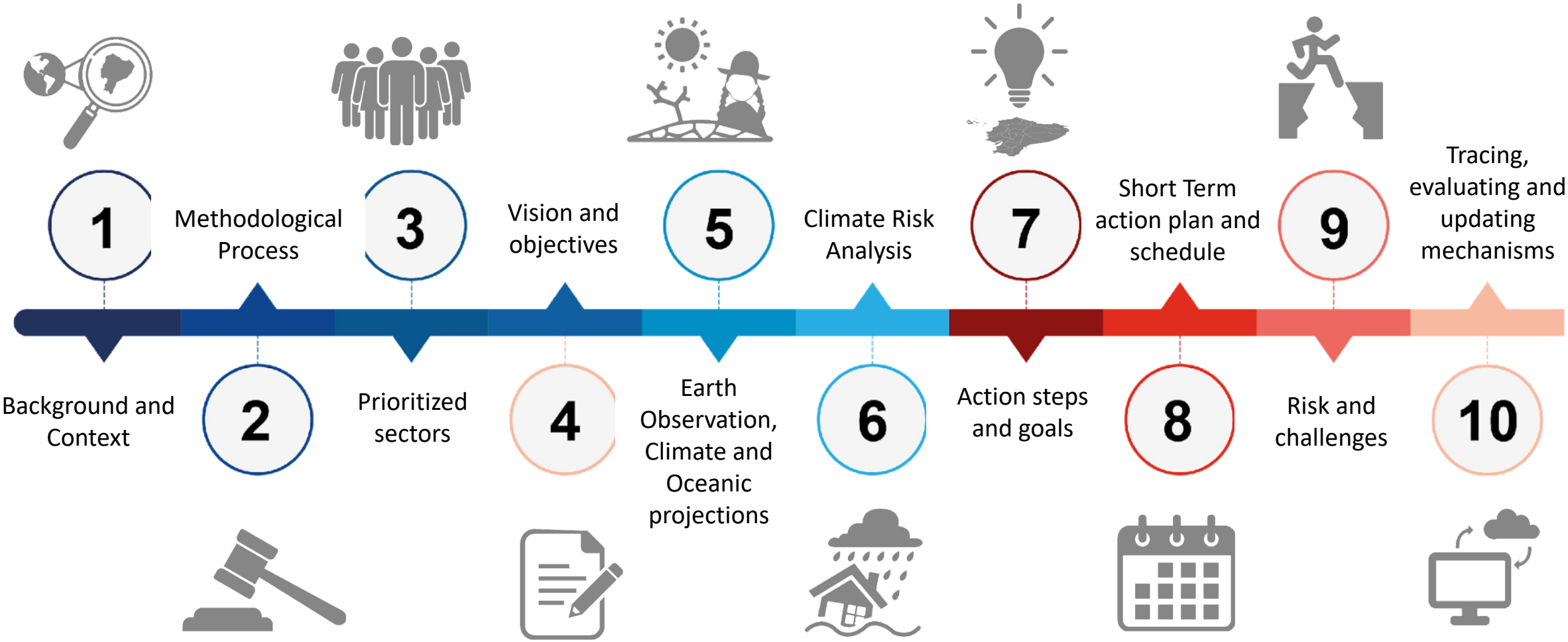
Content of the NAP



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Results of the National Adaptation Plan

Gobierno del Ecuador

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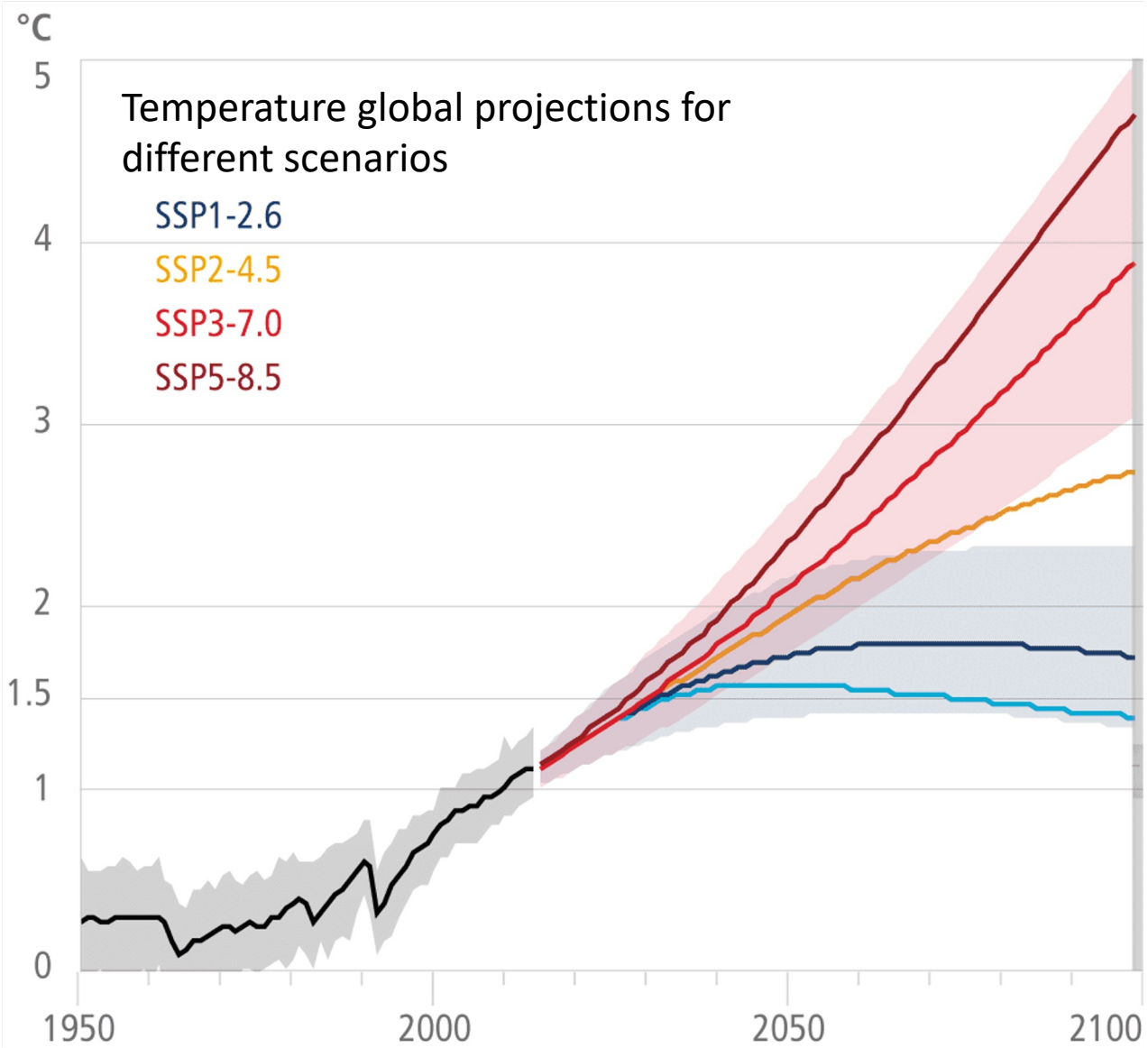
2.1 Future global climate change scenarios



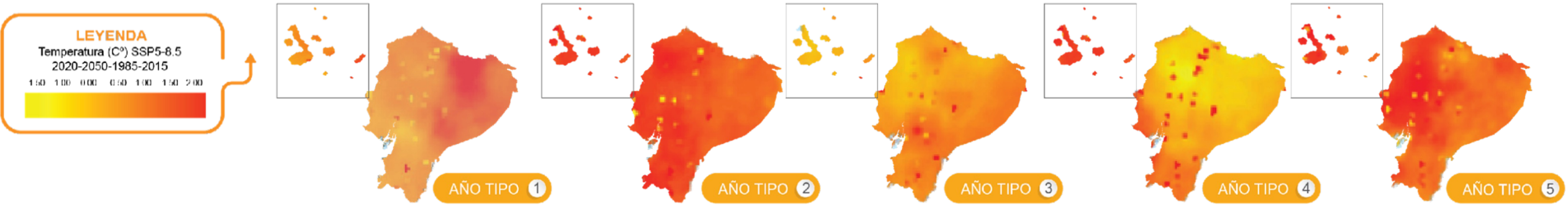
Catastrophic Climate Risk Scenario (SSP5-8.5)

- Economic and social development scenario based on the consumption of fossil fuels and natural resources.
- It prioritizes rapid economic development and is strengthened by the globalization of markets.
- It will potentially require Geo-Engineering measures to avoid higher temperatures.
- The population continues to grow towards 2100..

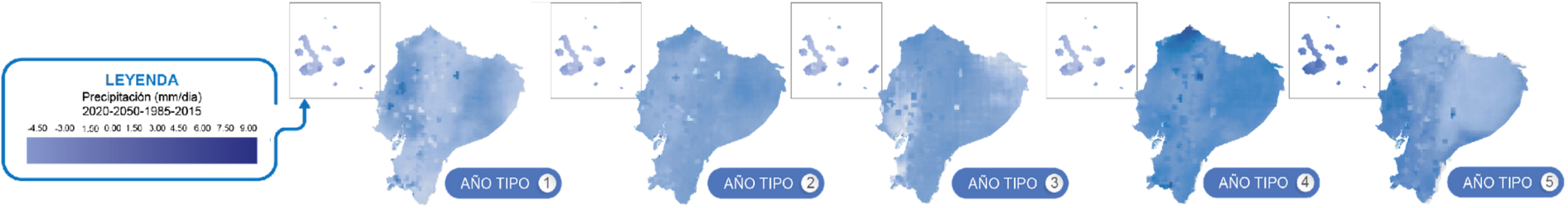
Ideal climate risk scenario(SSP1-2.6)

- Sustainable Development Scenario
- It prioritizes human well-being over economic development.
- Less intensive consumption of fossil fuels, natural resources and energy.

2.1 Results of climate projections of Ecuador

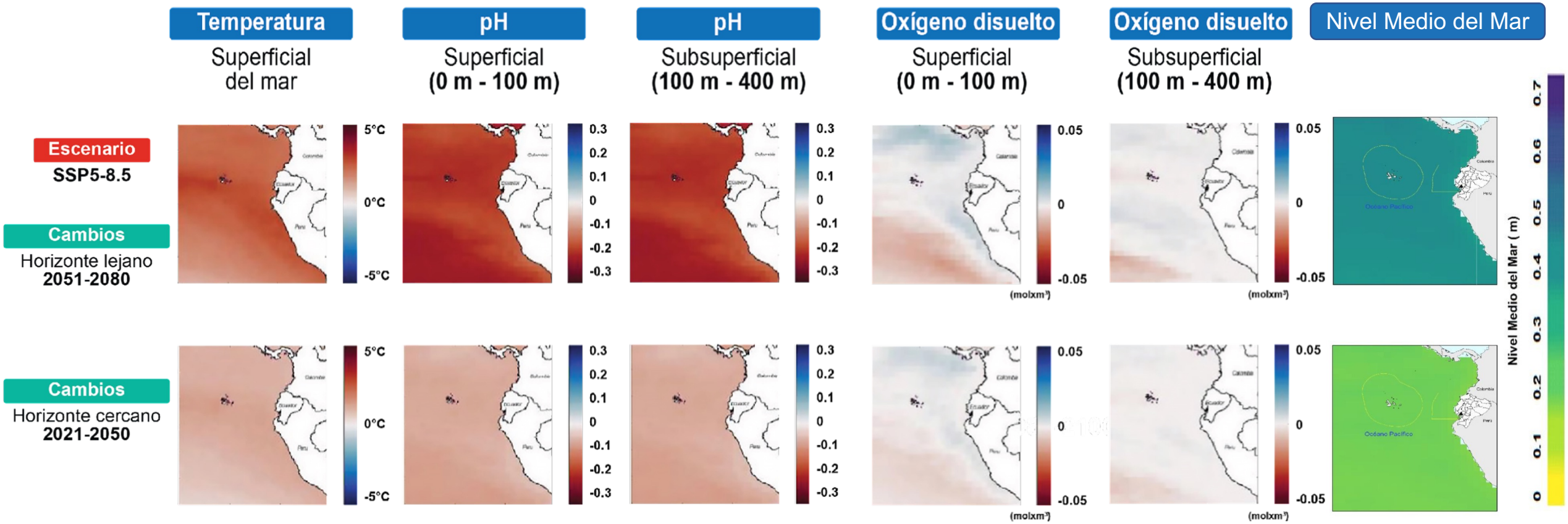


Extreme average temperatures of up to GREATER than 2 degrees Celsius above average.



Extreme events of 9 mm of precipitation per day GREATER than the current average
Drought events with 4.5 mm of precipitation per day LESS than average

2.1 Results of oceanic projections of Ecuador



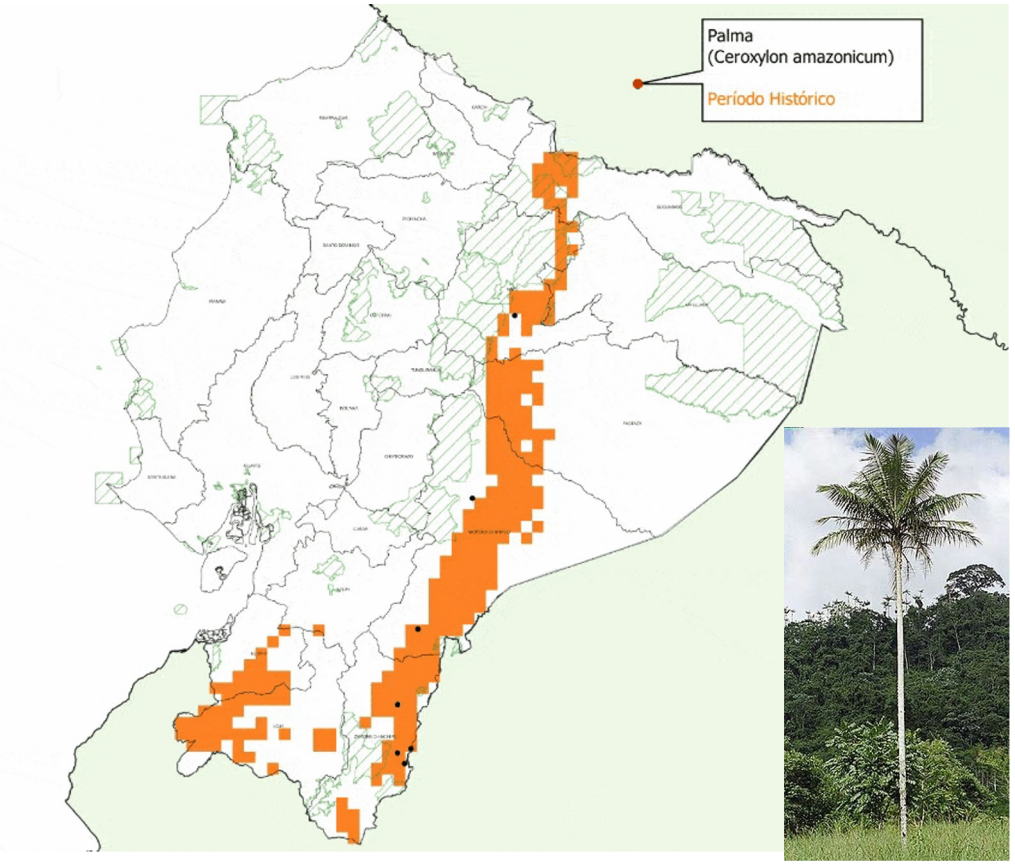
Higher sea surface temperature

Increased acidity in the ocean

Changes in dissolved oxygen in the sea

Rise in mean sea level

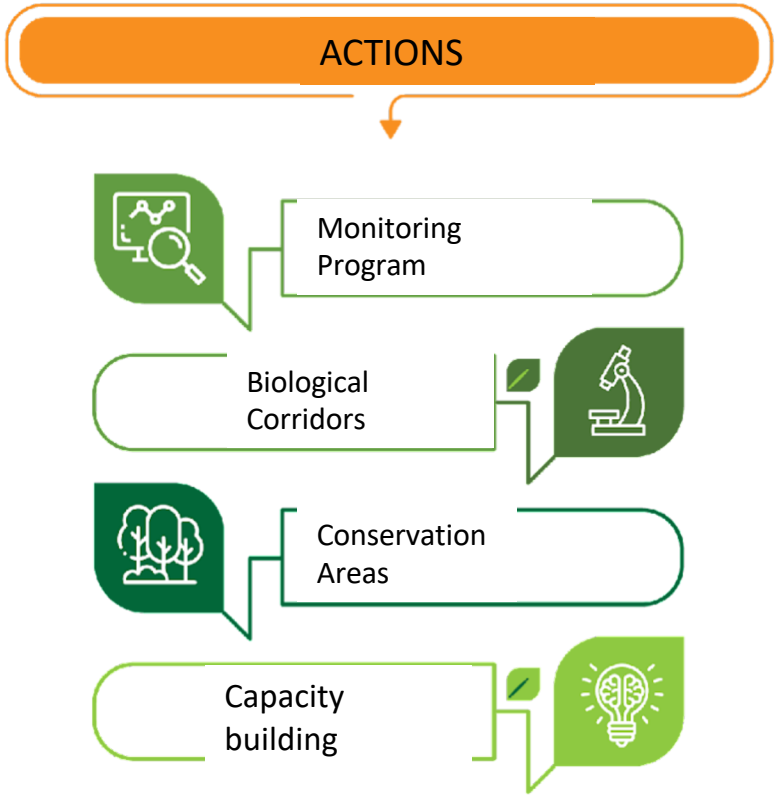
2.2 Climate Risk and Adaptation



Risk of preservation of endemic vascular species.

12 species vulnerable to the effects of climate change.

The provinces most affected by the reduction in the number of species due to future climate change is the northern part of Ecuador towards the Andes and Amazonia.



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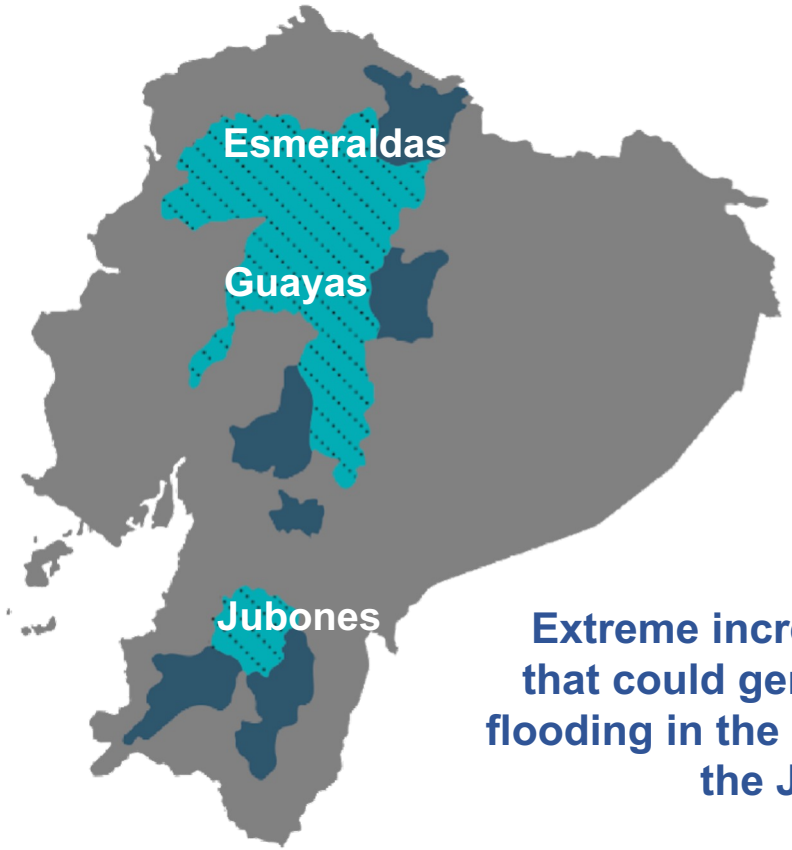
2.2 Climate Risk and Adaptation

Changes in flows in the Esmeraldas River basin that could generate greater flooding or times of scarcity.

Extremely low flows that could limit the supply of drinking water in the Guayas River basin.



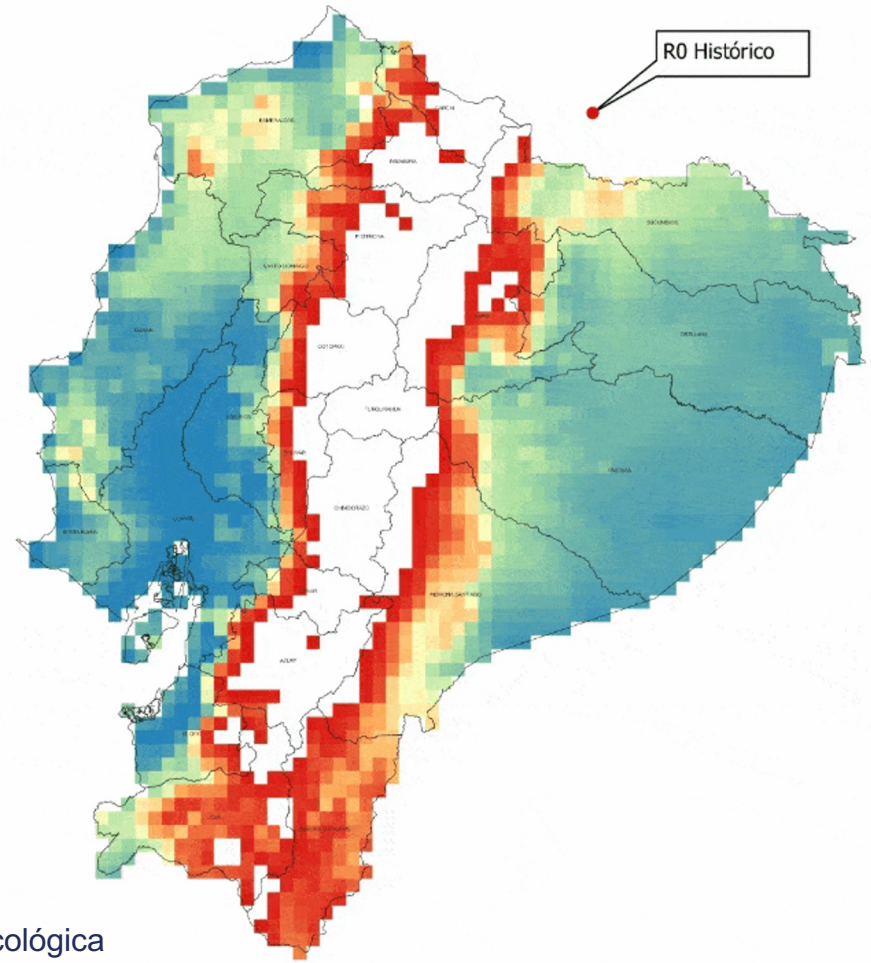
Extreme increases in flows that could generate serious flooding in the lower basin of the Jubones River.

ACTIONS

- Monitoring Program
- Biological Corridors
- Conservation Areas
- Capacity building

2.2 Climate Risk and Adaptation

Greater possibility of proliferation of dengue in regions in red under adverse conditions of climate change.

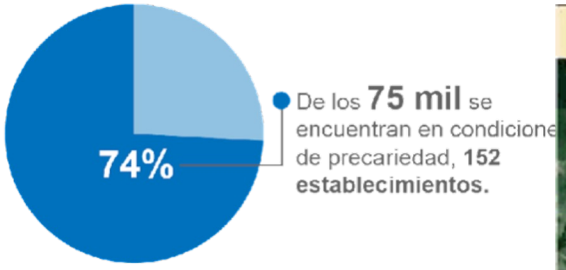


ACTIONS

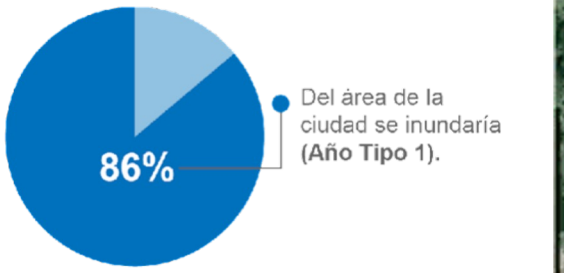
- Monitoring Program
- Biological Corridors
- Conservation Areas
- Capacity building

2.2 Climate Risk and Adaptation

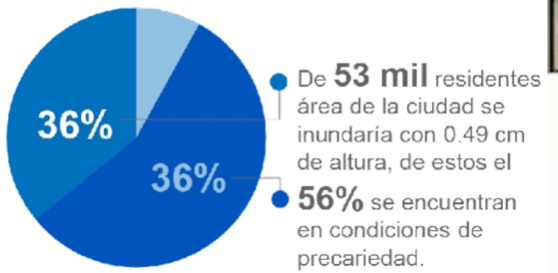
The cities analyzed have more than 70% of the population in a state of precariousness, and in the near future it is expected that flood zones will increase.



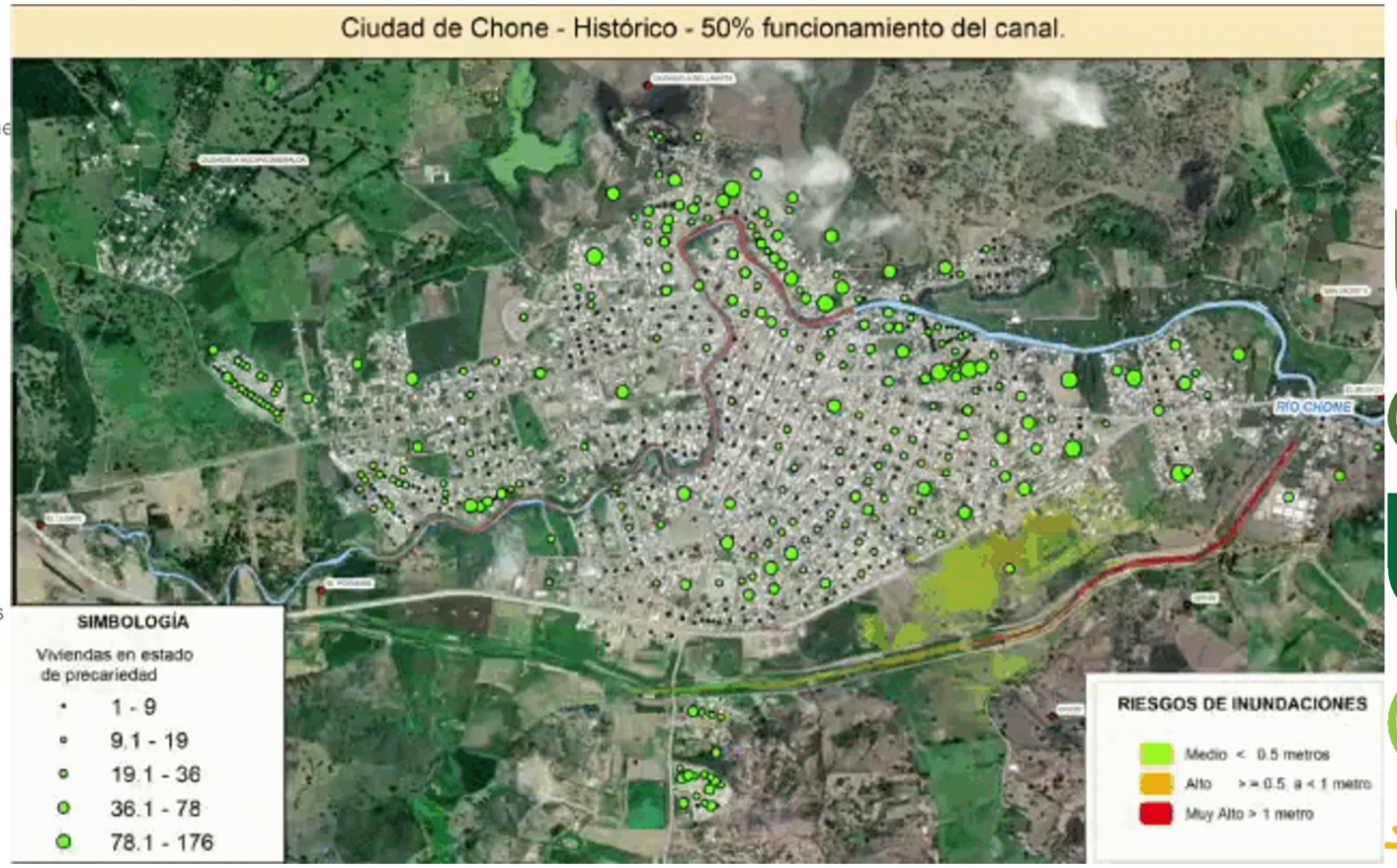
De los **75 mil** se encuentran en condicione de precariedad, **152 establecimientos.**



Del área de la ciudad se inundaría **(Año Tipo 1).**



De **53 mil** residentes área de la ciudad se inundaría con 0.49 cm de altura, de estos el **56%** se encuentran en condiciones de precariedad.



ACTIONS

- Dam construction.
- Ecological restoration.
- Early Alert Systems.
- Retaining walls and slope stabilization

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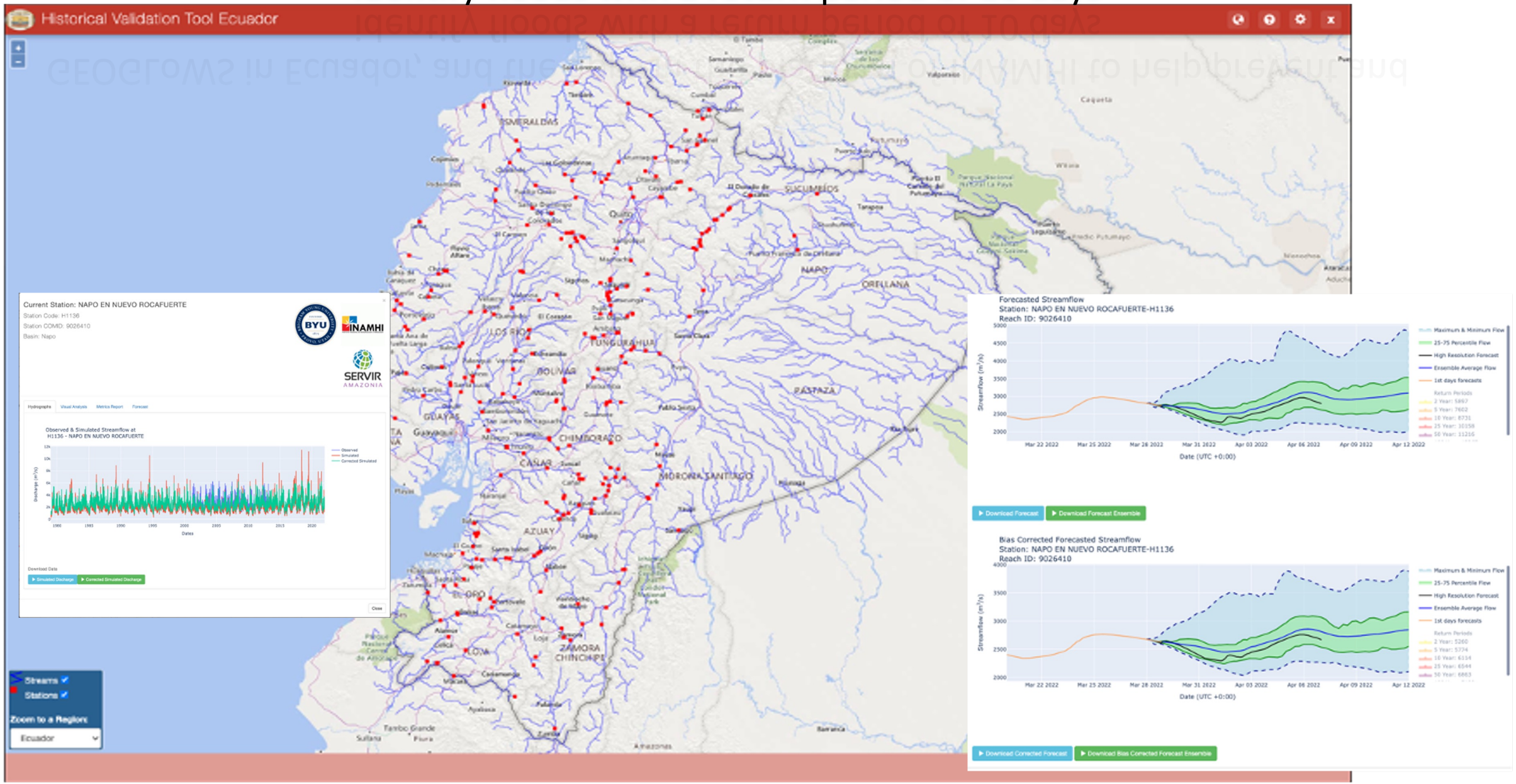
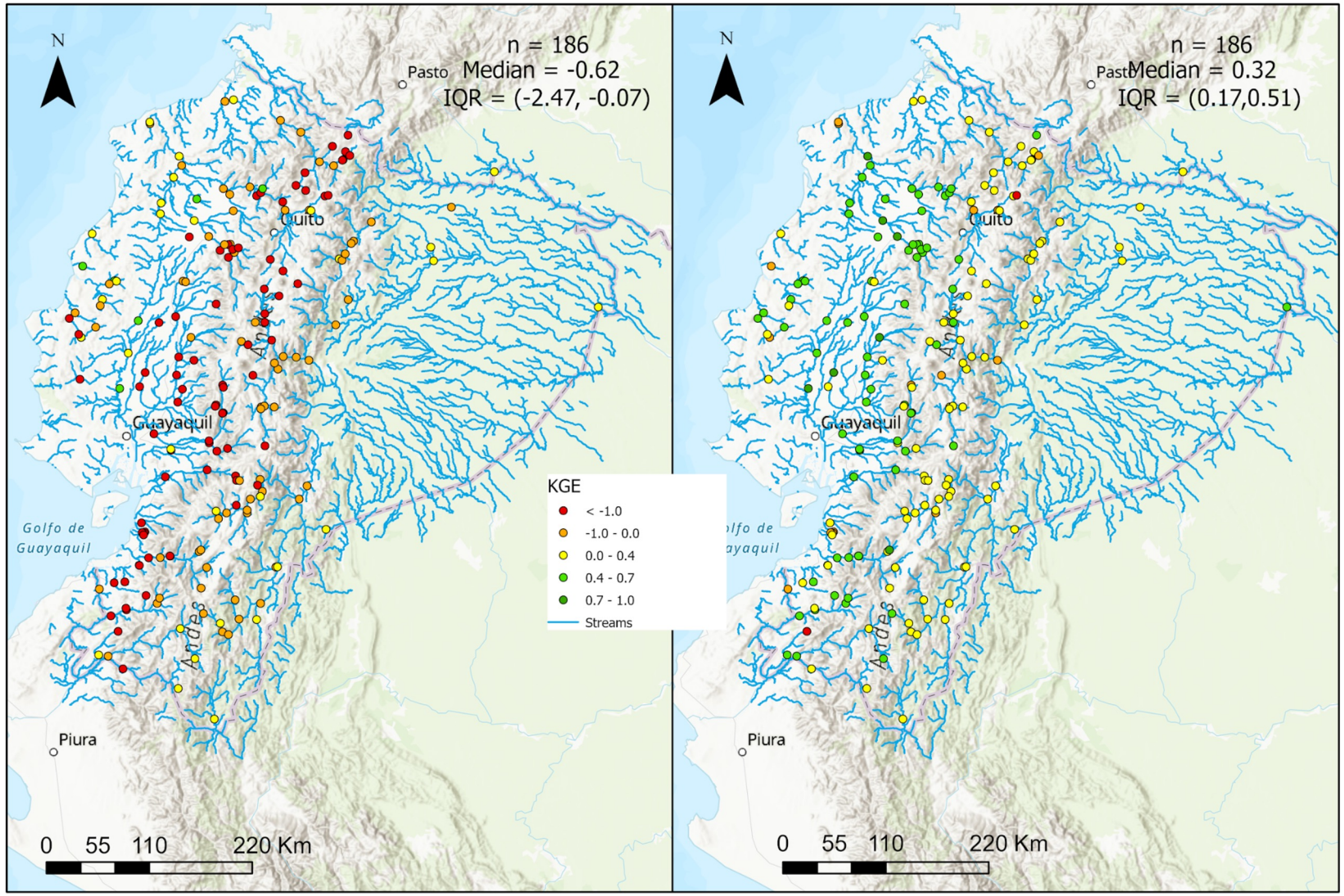
GEOGLoWS in Ecuador, and the apps in the platform of INAMHI to help prevent and identify floods with a return period of 10 days



KGE Ratio for GESS-ERA5 River Discharge Reanalysis and Observed Discharge Values

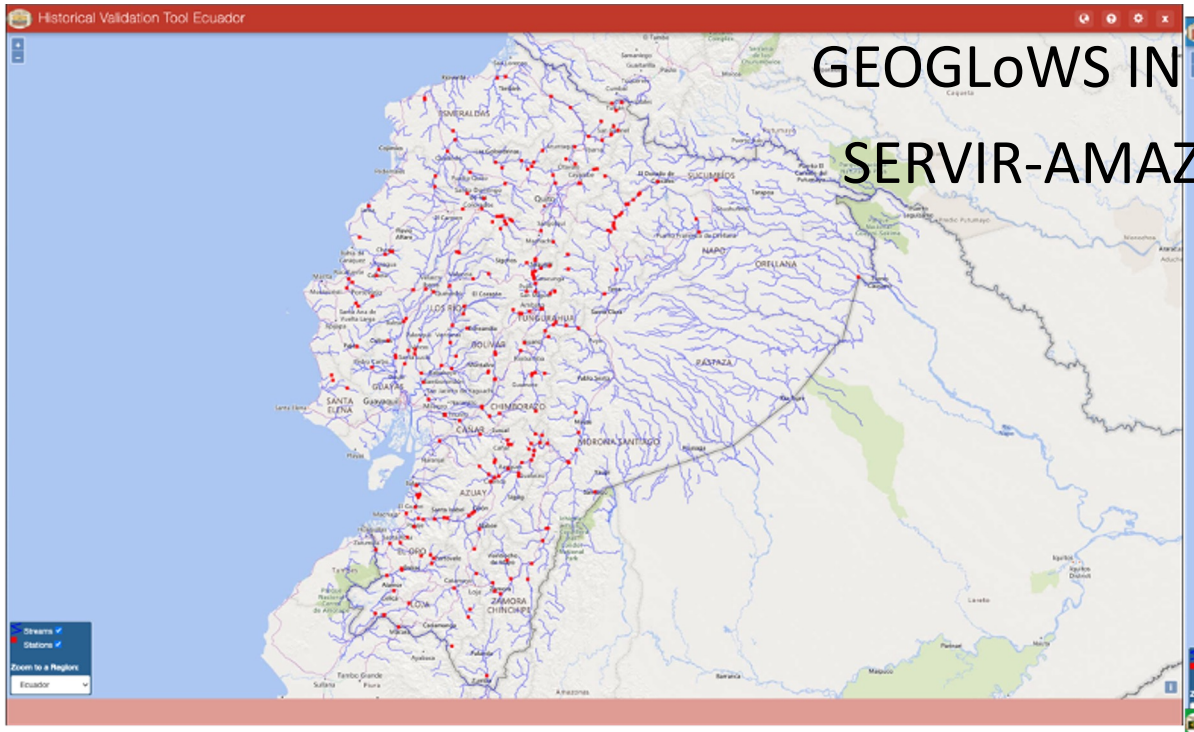


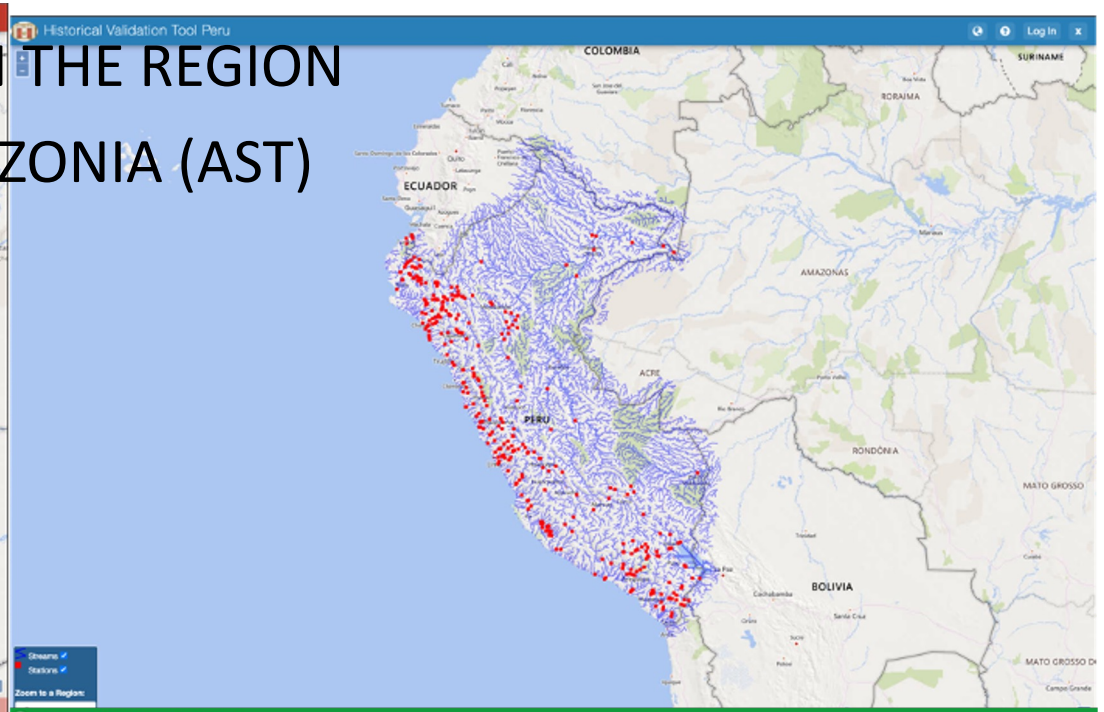
Original Simulation

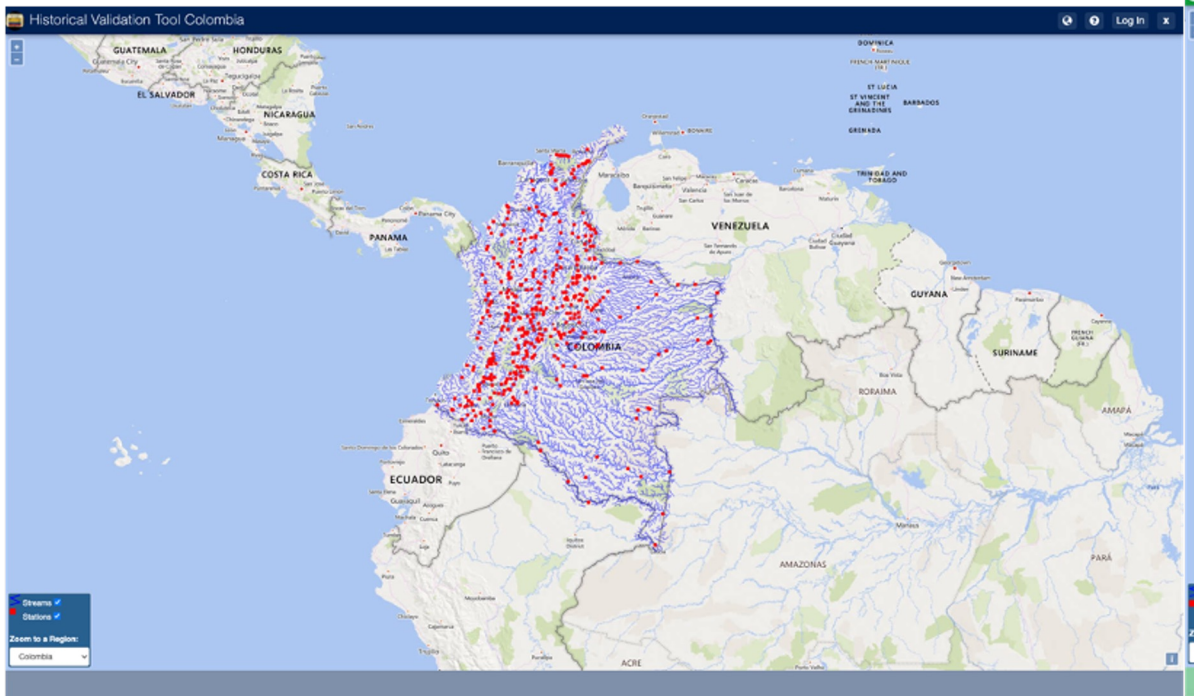
Bias Corrected Simulation

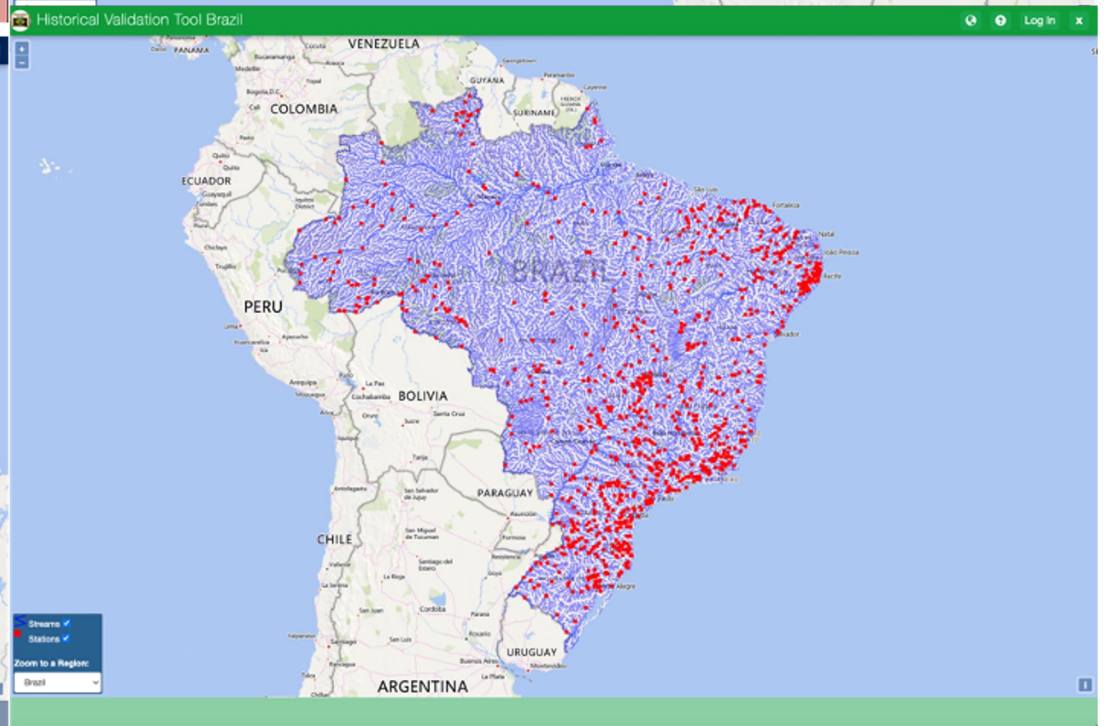
GEOGLoWS IN THE REGION

SERVIR-AMAZONIA (AST)









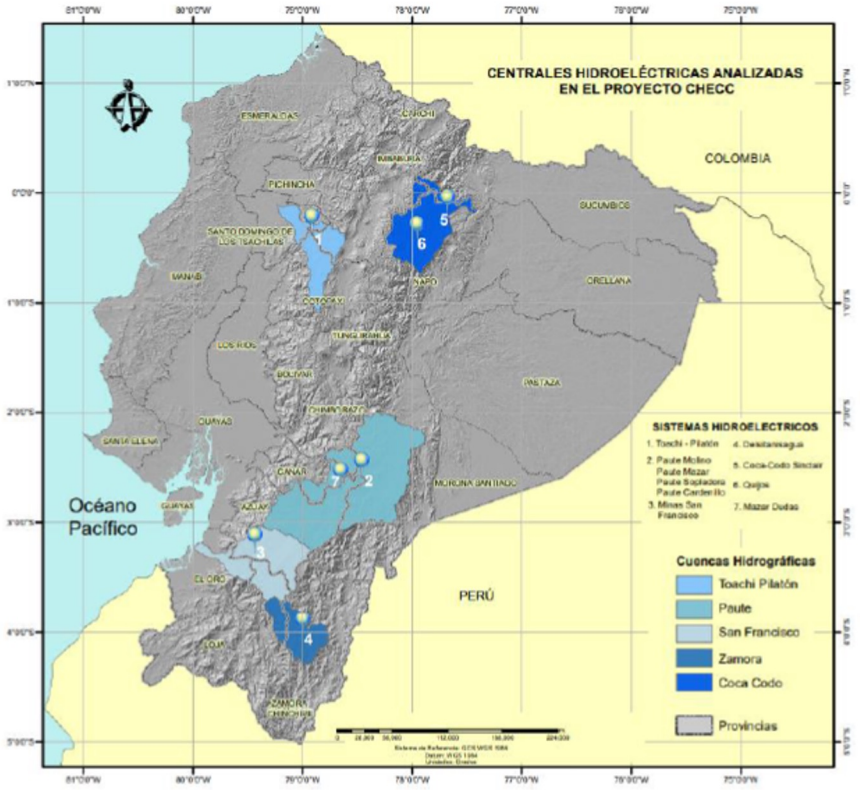
2.2 Climate Risk and Adaptation

Climate Risk Hydropower

- Less energy production in hydroelectric plants in the western cordillera.
- Greater sediments in hydroelectric plants in the eastern cordillera.

Climate Risk in SOTE (Oil Line)

- In future scenarios, higher flows and runoff are expected that can trigger floods and landslides. In the Amazon, an increase in the floodable area is expected up to 42%.



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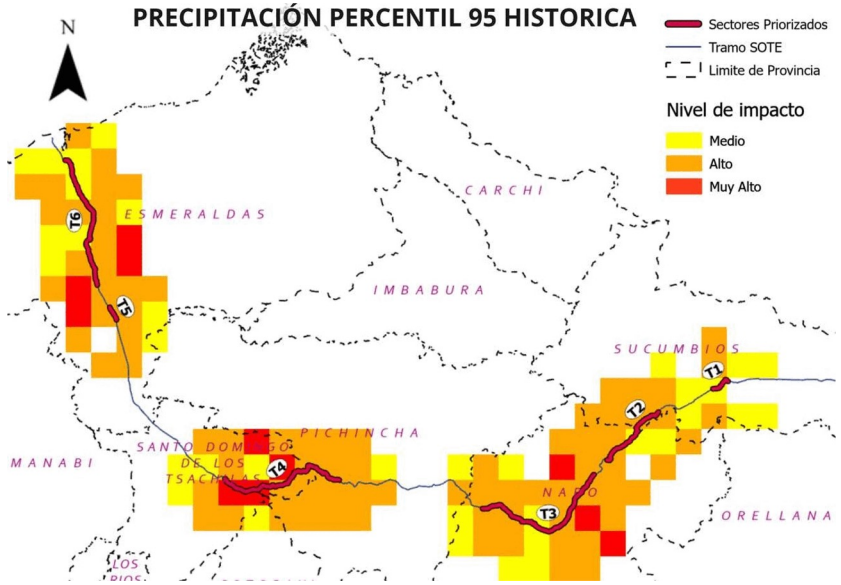

Tramo SOTE priorizado en Provincia de Esmeraldas

ACTIONS

- Management of banks and streams
- Reforestation and restoration
- Sustainable production systems
- Strengthening of monitoring

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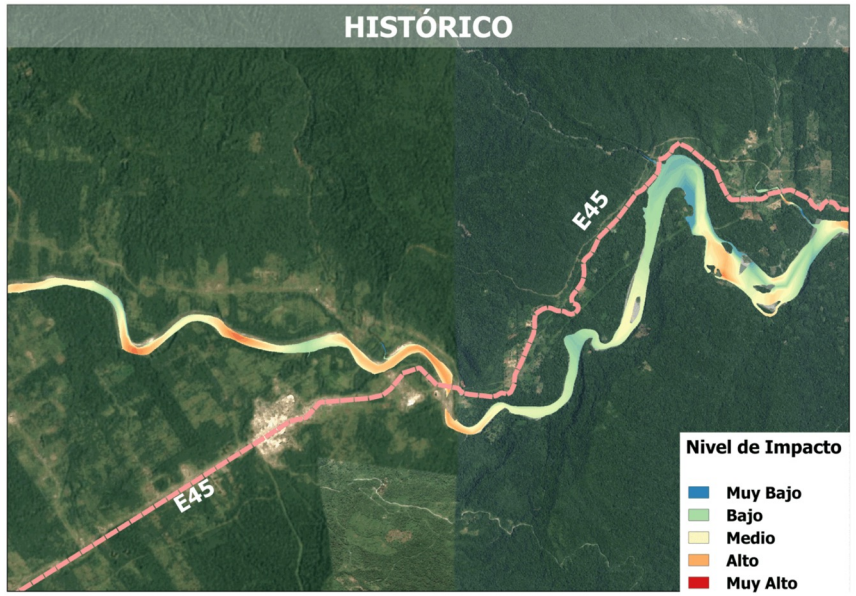
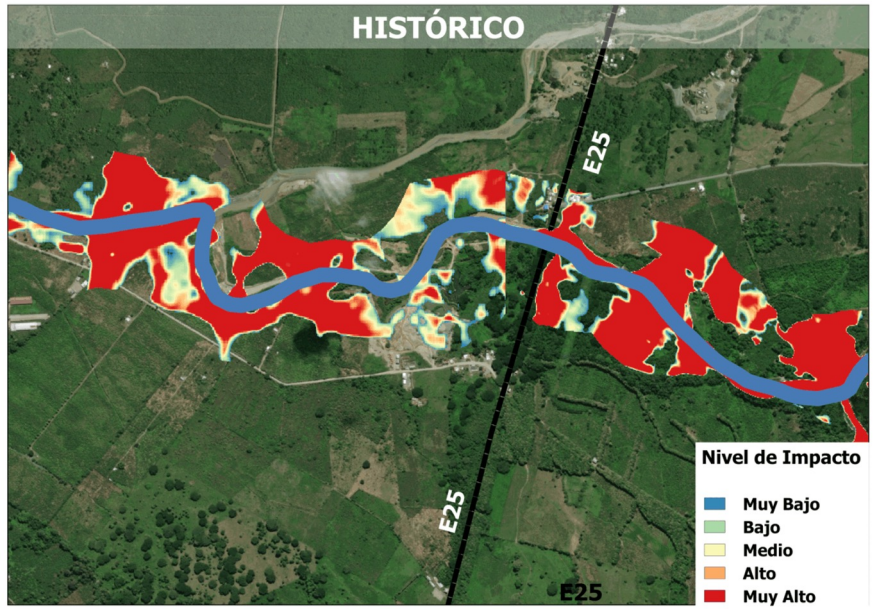
2.2 Climate Risk and Adaptation

Climate Risk in Road Infrastructure

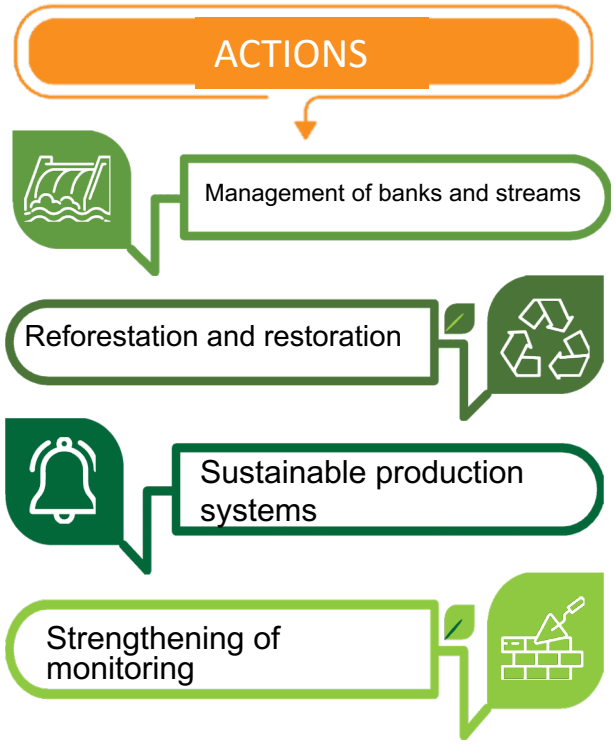
First-order road infrastructure will present a greater risk of flooding and landslides



E45 LUMBAQUI



E25 CAMILO - PONCE ENRIQUEZ



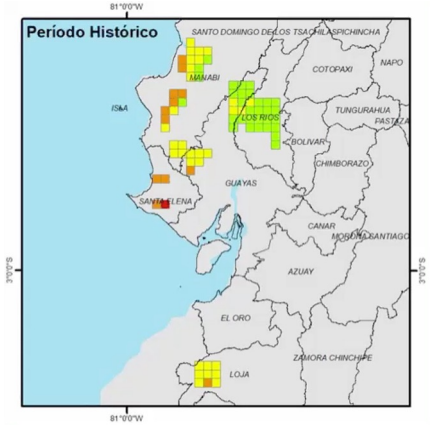
2.2 Climate Risk and Adaptation

Reduction of the 6 crops up to 50% in the worst scenario, 68% of rice is in unsuitable areas (AT1), 88% of sugarcane crops are in unsuitable areas (AT1), this involves higher costs of production.

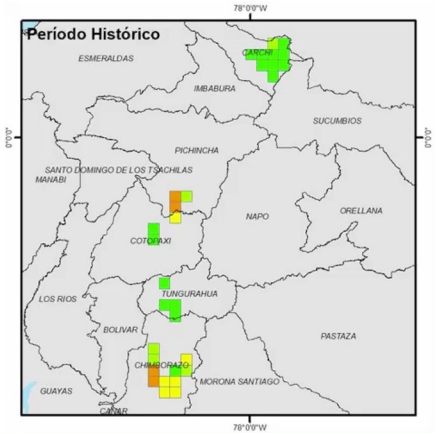
Example

Ideal places for the production of rice decrease due to the increase in rainfall greater than 2500 mm, an indicator that shows that under natural conditions they are not suitable for the production of rice crops

CHANGES IN YIELD

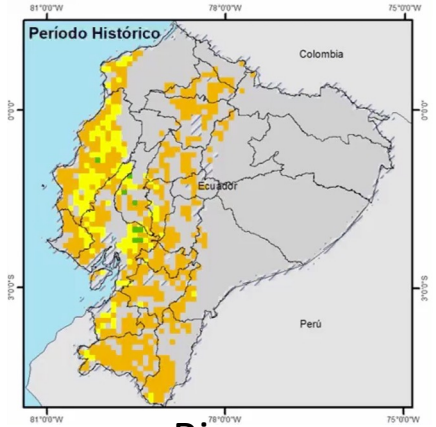


Hard Yellow Corn

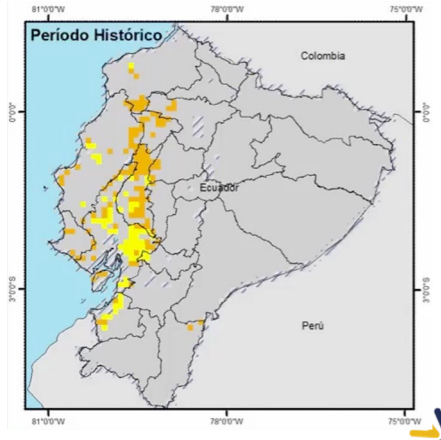


Potato

CHANGES IN SUITABILITY



Rice



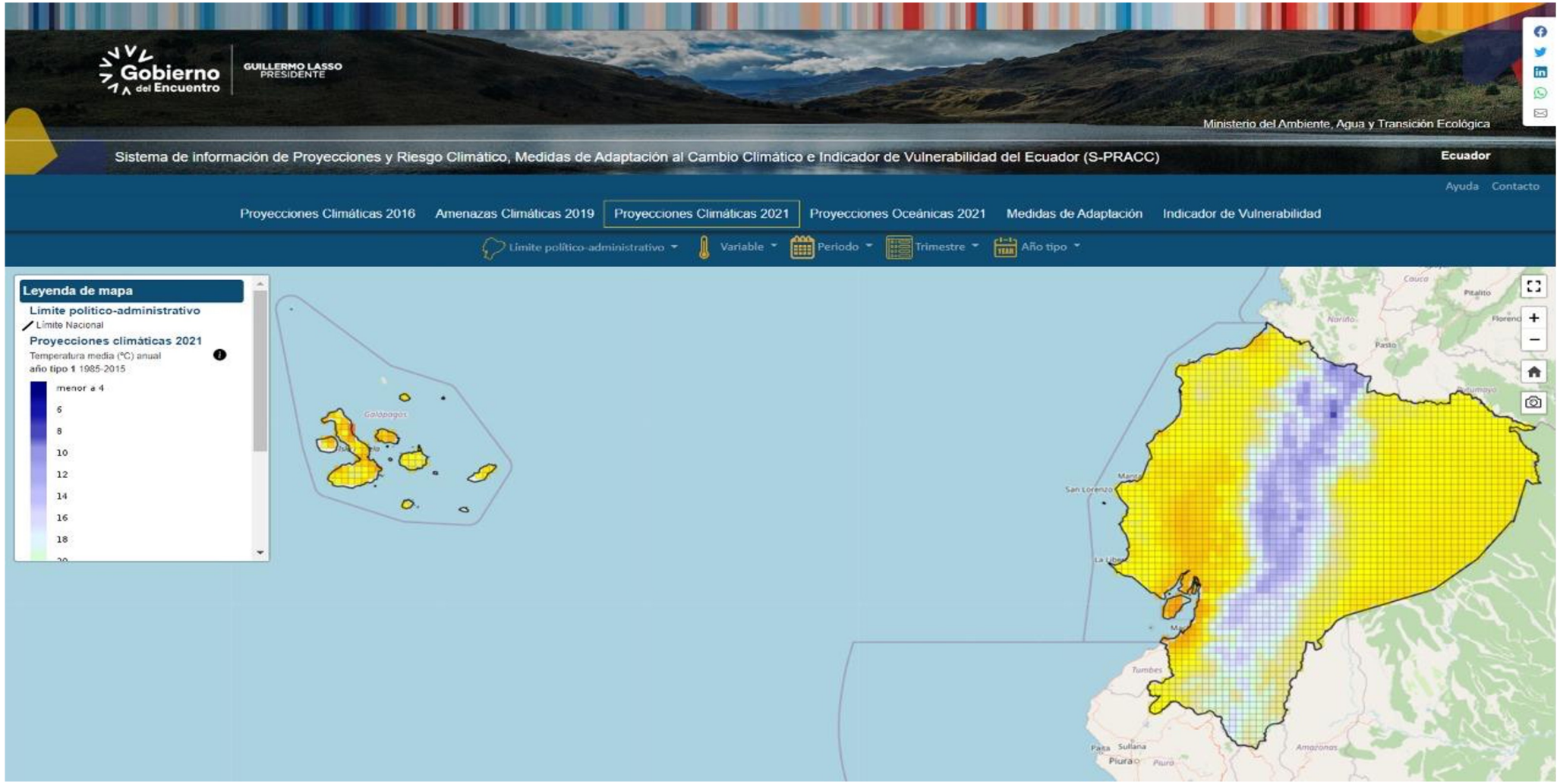
Sugar Cane

ACTIONS

- Irrigation systems
- Agricultural Insurance
- Good practices such as crop rotation
- Combined production systems

Gobierno del Ecuador
GUILLERMO LASSO
PRESIDENTE

Information system, projections, climate risk and adaptation to climate change



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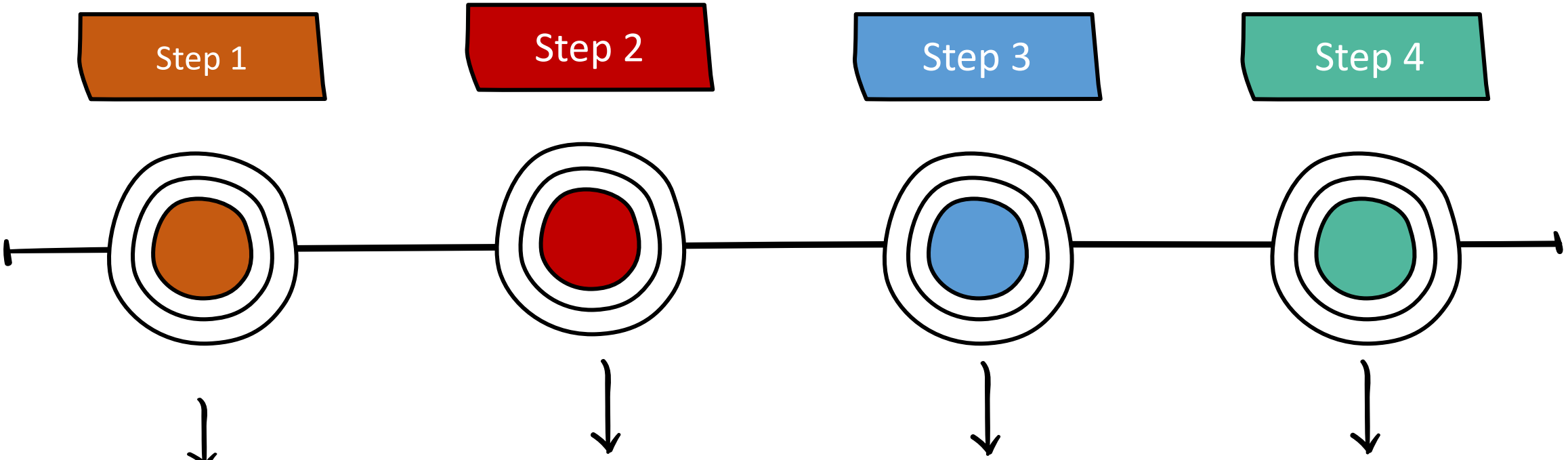
y Transición Ecológica

Next Steps

Gobierno del Ecuador

GUILLERMO LASSO
PRESIDENTE

Action Plan



Launch of the adaptation plan

Prior review of the document by the technical teams of the state portfolios

Prioritization projects and actions

Identification of joint actions based on the adaptation plan. Include more inputs

Identify and plan financing routes

Identify possible sources of financing and roadmaps to achieve it

Defined conceptual proposals

Documented and prioritized concept notes

Acknowledgements

Ministerio del Ambiente, Agua y Transición Ecológica

República del Ecuador · Gobierno del Encuentro · Juntos lo logramos

INABIO
Instituto Nacional De Biodiversidad

GREEN CLIMATE FUND

Instituto de Investigación Geológico y Energético

EP PETROECUADOR

Armada del Ecuador · Instituto Oceanográfico y Antártico

Ministerio de Agricultura y Ganadería

CONGOPE
Consorcio de Gobiernos Autónomos Provinciales del Ecuador

Ministerio de Salud Pública

Secretaría de Gestión de Riesgos

AME
Asociación de Municipalidades Ecuatorianas

INIAP
Instituto Nacional de Investigaciones Agropecuarias

Instituto Nacional de Investigación en Salud Pública INSPI – Dr. Leopoldo Izquieta Pérez

Parque Nacional Galápagos Ecuador

conagopare Nacional
Consejo Nacional de Gobiernos Parroquiales Rurales del Ecuador

Ministerio de Transporte y Obras Públicas

PNUD

Ministerio de Desarrollo Urbano y Vivienda

OCPECUADOR

INEC
instituto nacional de estadística y censos

Agencia de Regulación y Control de Energía y Recursos Naturales No Renovables

Ministerio de Energía y Minas

FIIAPP
Cooperación Española

FAO
Fiat Panis

CELEC EP
Corporación Eléctrica del Ecuador

INAMHI
Instituto Nacional de Meteorología e Hidrología

Ministerio del Ambiente, Agua y Transición Ecológica

Thank You

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Gobierno del Ecuador | GUILLERMO LASSO PRESIDENTE

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GEO GROUP ON EARTH OBSERVATIONS

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Andria Rosado-Grinage, Belize Coastal Zone Management Authority and Institute

Andria is the GIS/Data Manager at the Belize Coastal Zone Management Authority and Institute.

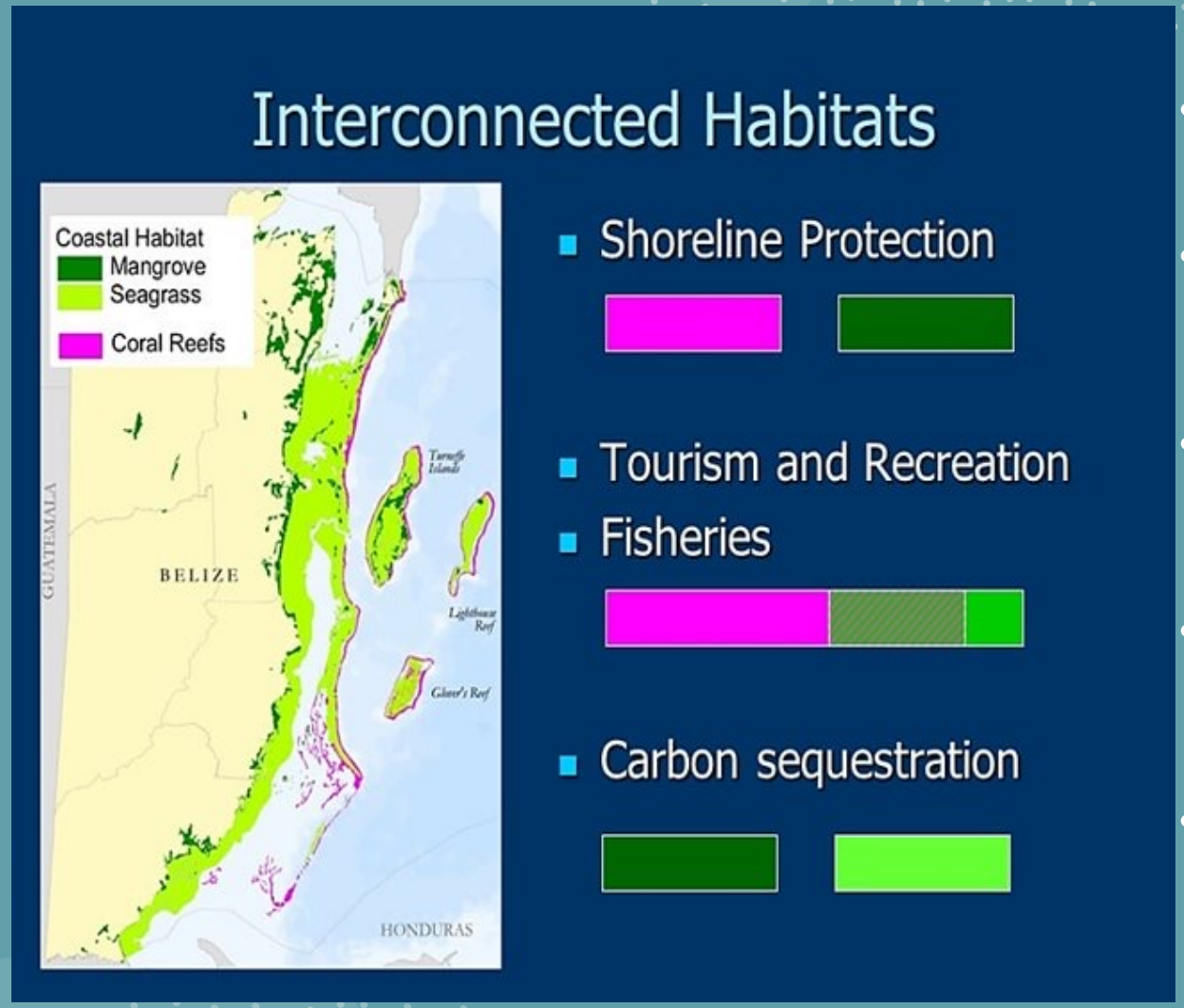
In her capacity, she is responsible for providing geospatial support to the institute which guides planning and decision making for sustainable use and management of Belize's coastal resources.

She manages the Data Management Program and the Coastal & Marine Data Center which shares data to academia, government, NGO's and the public.

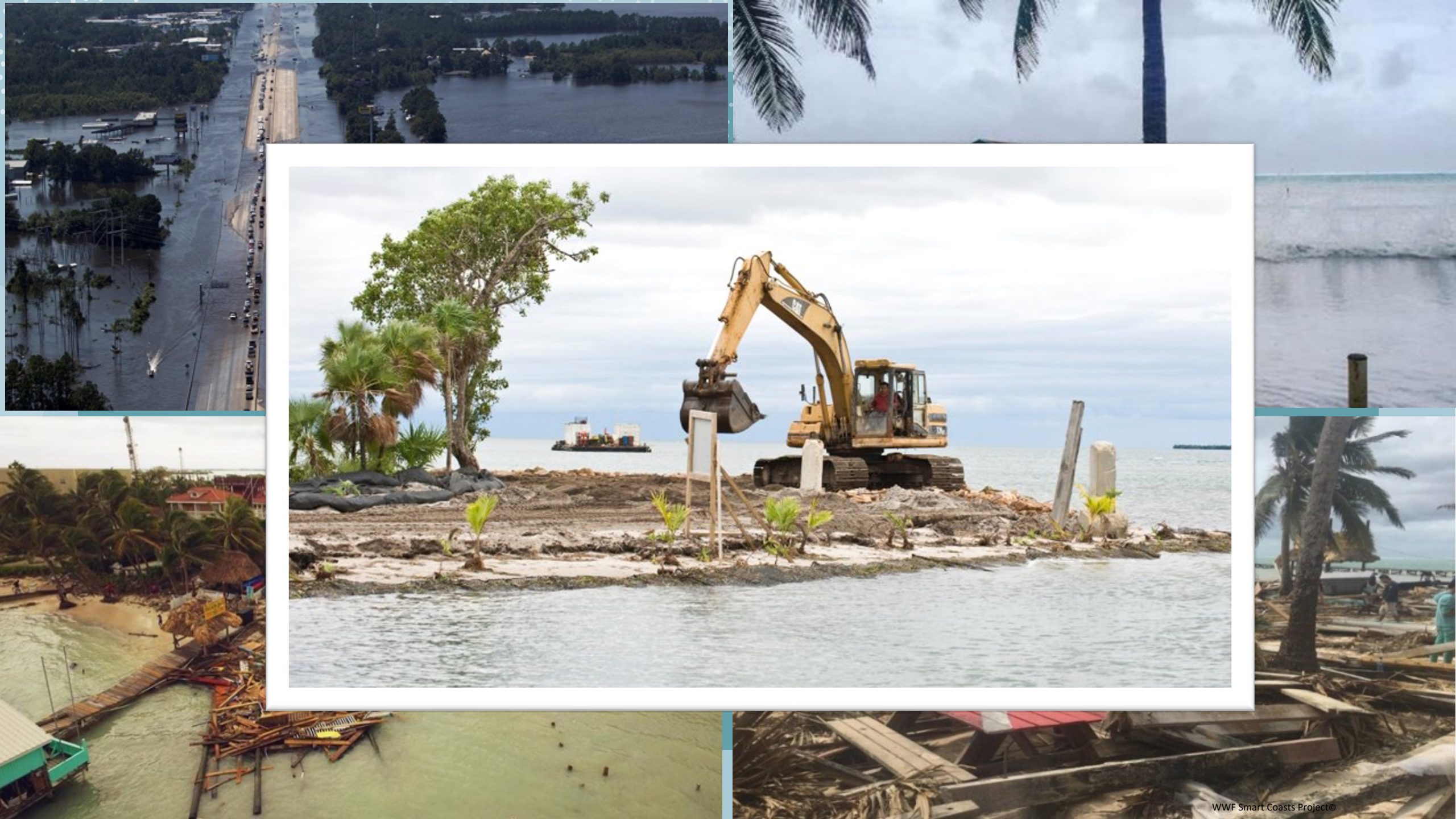
AI for the Marine Habitat Map in support of the Belize NAP

Andria Rosado-Grinage,
Coastal Zone Management
Authority & Institute

Belize's Coasts is…



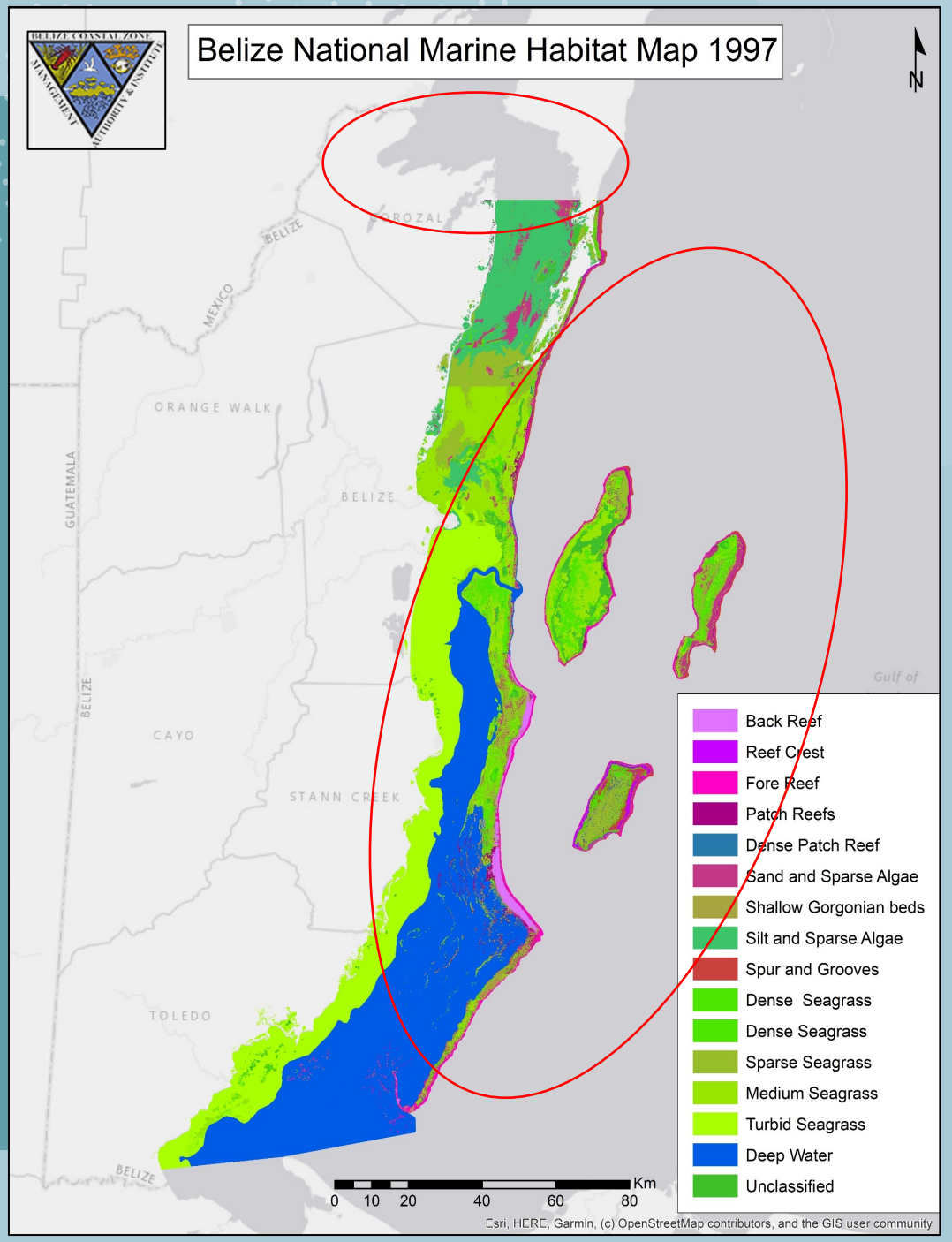
- Mostly flat/low-lying
- Vulnerable to climate change impacts (sea level rise, storms events, flooding, etc)
- Threat to sustainability (social, economic and ecological)
- Mangroves, seagrass beds and coral reefs help (coastal protection, filter runoffs)
- Other benefits (biodiversity, livelihoods, economy)



AI For the Belize Habitat Map

Enhancing adaptation planning and increasing climate resilience in the coastal zone and fisheries sector of Belize

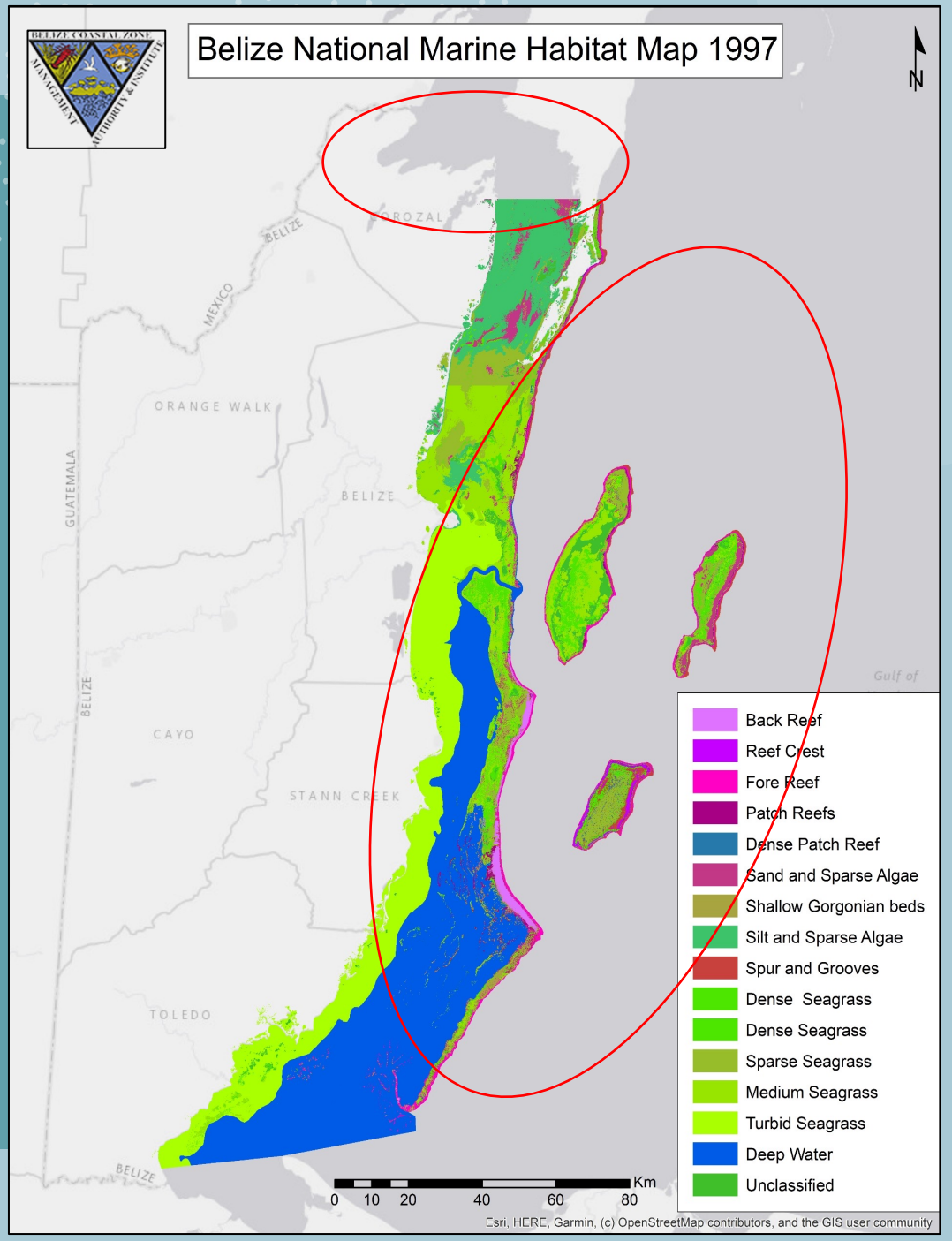
And integration of effective costal zone management to ensure long term health and resilience of marine and coastal ecosystems



AI For the Belize Habitat Map

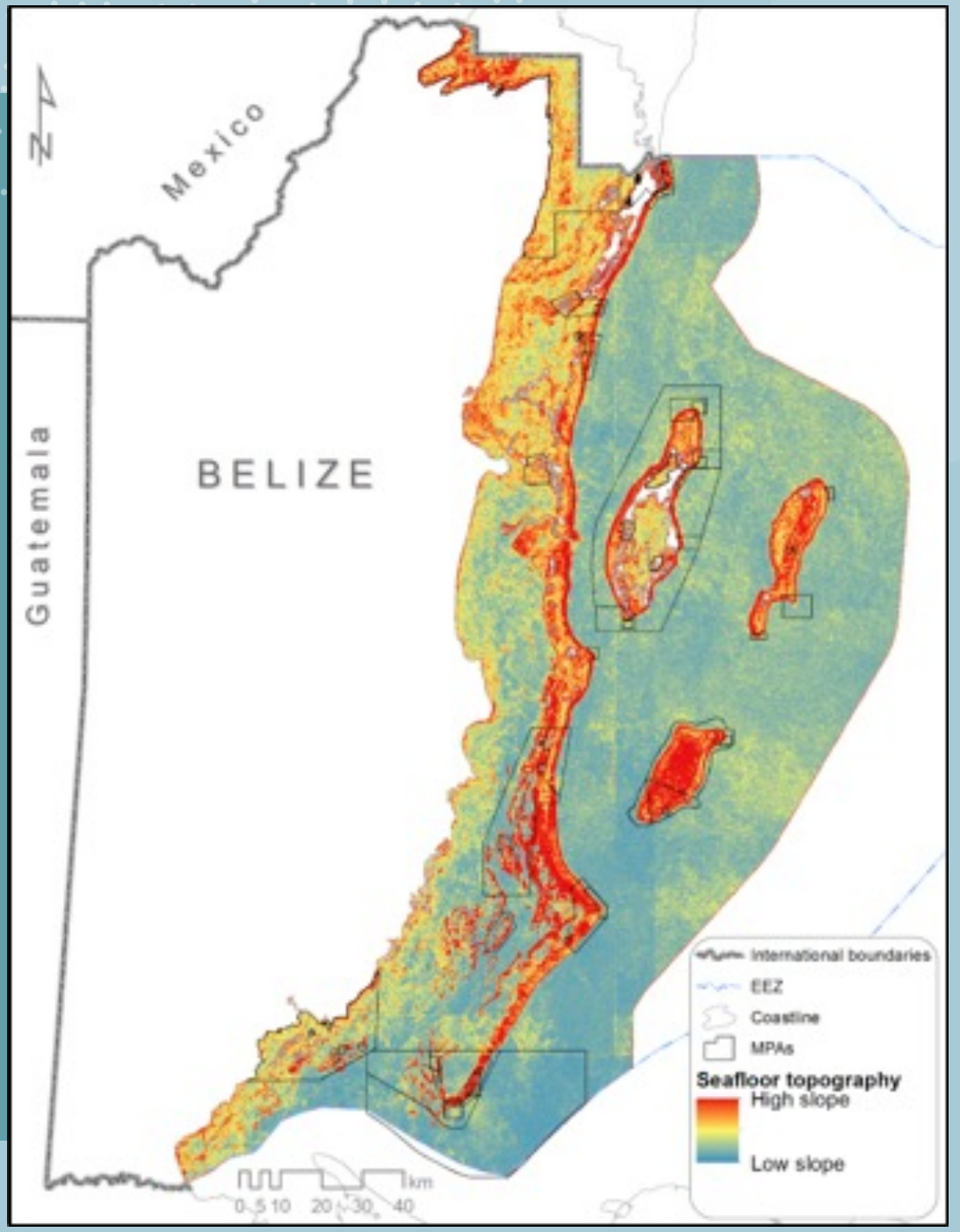
Update the 1997 National Marine Habitat Map (NMHM)

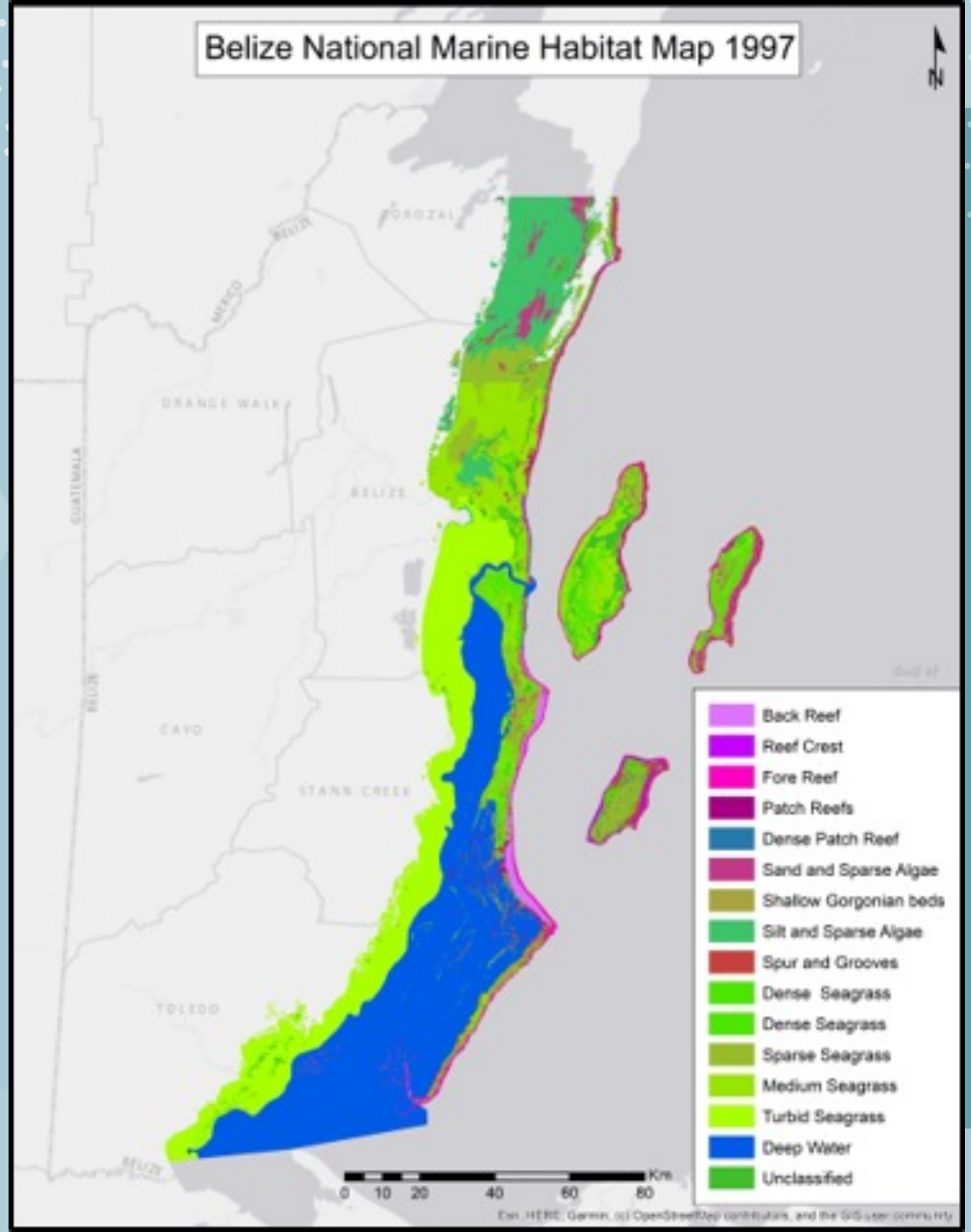
Focusing on Belize's coastal and marine ecosystems with particular focus on coral reefs, and mangrove ecosystems.

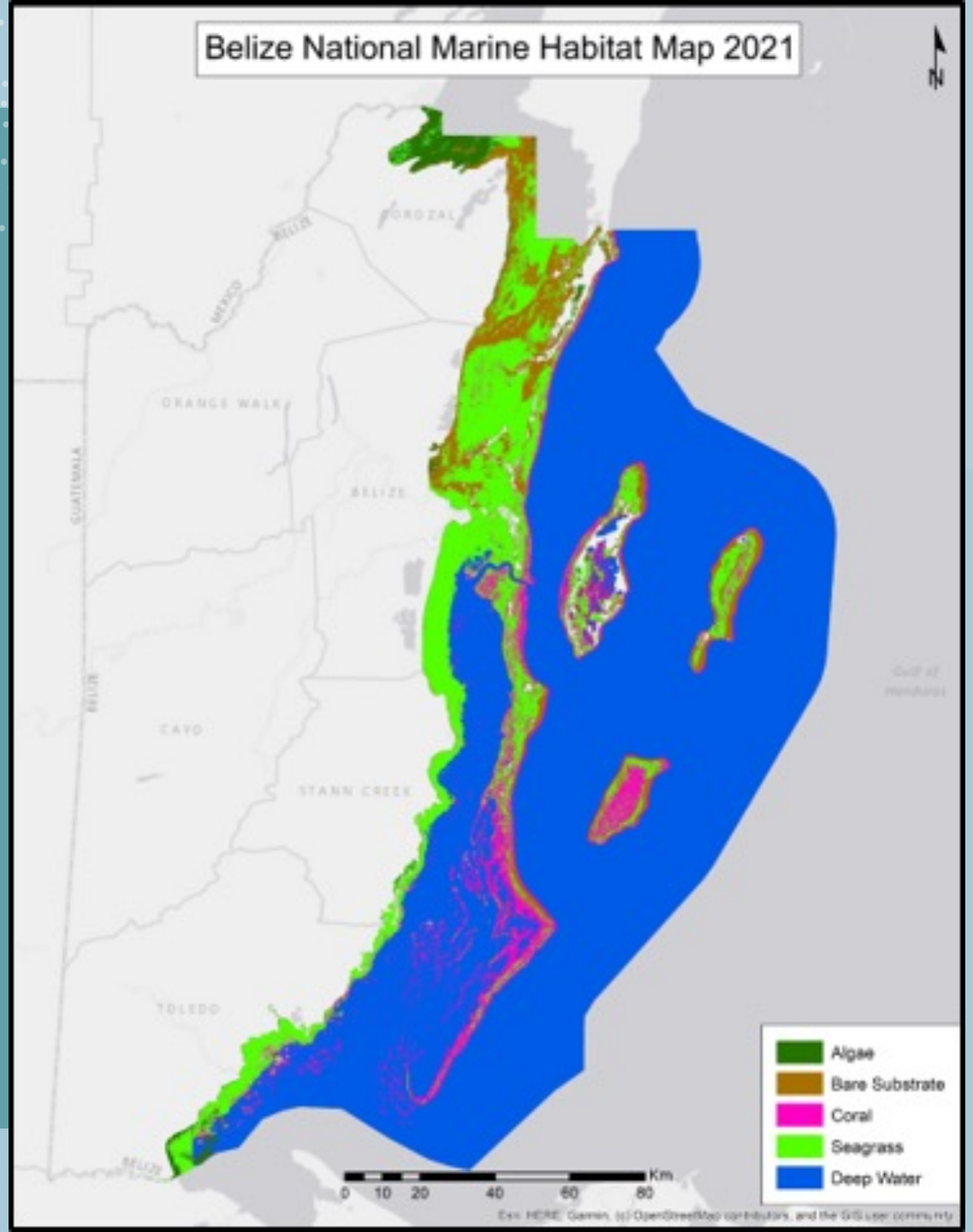


In situ ecosystem survey collected from Marine Protected Areas co-managers and integrated with satellite data

Range of satellite data acquired were used and processed within VM’s on Microsoft Azure including publicly available data from the Copernicus Sentinel-2.




Belize National Marine Habitat Map 1997
N
Back Reef
Reef Crest
Fore Reef
Patch Reefs
Dense Patch Reef
Sand and Sparse Algae
Shallow Gorgonian beds
Silt and Sparse Algae
Spur and Grooves
Dense Seagrass
Dense Seagrass
Sparse Seagrass
Medium Seagrass
Turbid Seagrass
Deep Water
Unclassified
0 10 20 40 60 80
Km


Belize National Marine Habitat Map 2021
N
Algae
Bare Substrate
Coral
Seagrass
Deep Water
0 10 20 40 60 80
Km

Better understanding of the status and temporal distribution of ecosystem health and function

Knowledge gaps filled as it relates to coastal zone management

Integration onto the future National Adaptation Plan (NAP) for the fisheries sector and coastal zone areas of Belize.

Contacts

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#NAPExpo #EO4Impact

@GEOSEC2025

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Natalia Bermudez, NASA Servir AmeriGEO

Natalia is the InterAmerican Associate for SERVIR within the Capacity Building team of the Applied Science Program at NASA. She collaborates with SERVIR hubs and other Capacity Building networks in the region (USGEO, AmeriGEO, CEOS, EOTEC Dev Net Americas, UNGGIM Americas) to promote and connect activities related to the use of the Earth Observation in developing countries in Latin America and the Caribbean.

She has a background in Geographic Information Science, Social Studies, and Environmental Management. Besides land cover change and disaster risk reduction, her research interests are tied to interconnecting earth observations, socio-cultural data, and vulnerability analysis. Natalia is also passionate about collecting world music.

Examples of Earth observations-enabled adaptation across the Americas

Natalia Bermudez

NASA Servir, AmeriGEO

Conceptual Approach to Adaptation

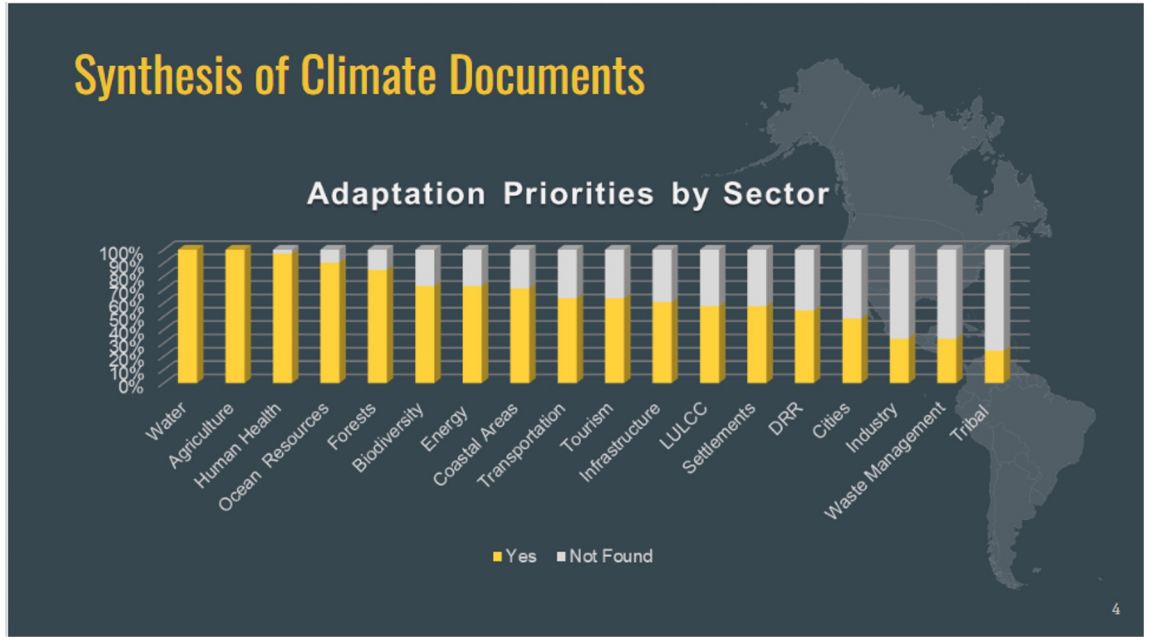
UNFCCC defines……**Adaptation** to adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects.

No 'one-size-fits-all-solution' - adaptation can range:

- **Building flood defences**
- **Setting up early warning systems**
- **Switching to drought-resistant crops**
- **Redesigning communication systems**
- **Business operations and government policies**
- **Including local communities & Indigenous People**

The two overarching objectives of NAPs are to:

1. Reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience.
2. Integrate adaptation into new and existing policies and



Author: LACI - Amber Kremer


Science &
EO Data
Social
Needs
How to manage the increasingly extreme disasters we are seeing,
How to protect coastlines and deal with sea-level rise,
How to best manage land and forests,
How to deal with and plan for drought and fire emergencies?
How to develop new crop varieties, and how to protect energy and public infrastructure?

As of March 2023, NASA's portfolio included 23 on-orbit missions

Sentinel-6 Michael Freilich ›

Time in orbit: 2 years : 112 days

Joint U.S.-European effort
Monthly average rising sea levels

SWOT ›

Time in orbit: 0 years : 89 days

Global survey water body
To Improve Weather Climate predictions

OCO-3 ›

Time in orbit: 3 years : 314 days

Measure CO2 / Carbon Cycle
Takes stock CO2 emissions by Country

NASA as one the participating agencies of USGCRP

A long term record, combined with observations from NASA Earth System Observatory, will continue to push boundaries to create better models and predictions for climate change adaptations

InterAmerican Network

GEO Member Map of the Americas for the year 2023

GEO GROUP ON EARTH OBSERVATIONS

AmeriGEO

USGS science for a changing world

SICA

IAI 30 years

SERVIR AMAZONIA

esri

IDEAM

MINAE Ministerio de Ambiente y Energía

USGEO United States Group on Earth Observations

UNDP

LACI

AQUAVEO

CIAT

USAID FROM THE AMERICAN PEOPLE

NOAA

BYU Brigham Young University Founded 1875 Provo, Utah

ECMWF

NASA

Early Warning Systems - Forecasting

Forecasting Seasonal to Sub-Seasonal Fire and Agricultural Risk from Drought (In Development)

Extended dry seasons and drought are a threat to agricultural food systems and increase vulnerability.

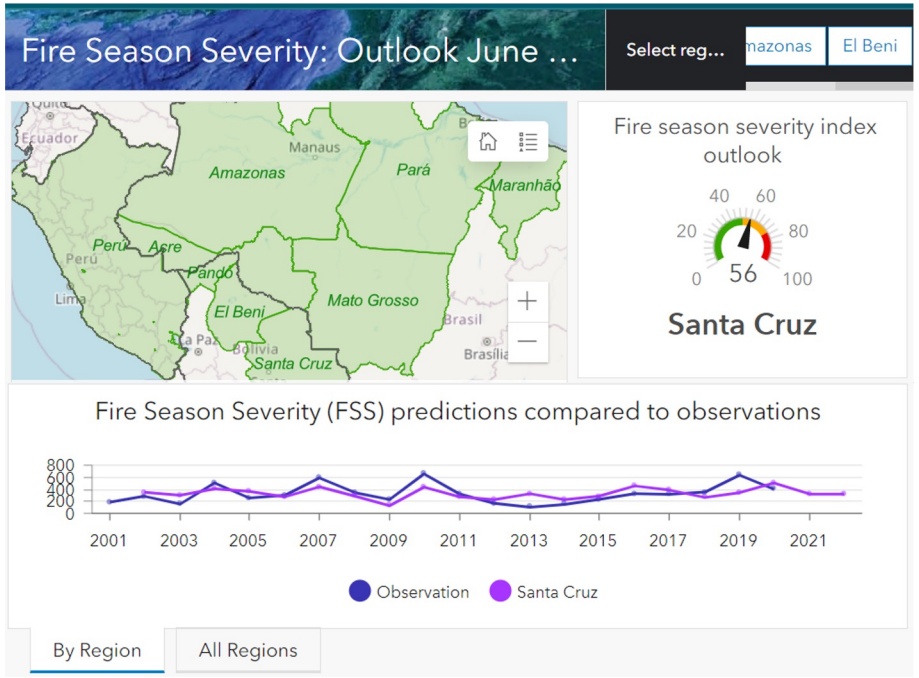
Gap: The Amazon has a long history of fire detection work, fire forecasting tools and their impacts on reducing food insecurity in the region are produced at coarse scales, not always applicable for subnational management needs, and capacity at these levels is also sometimes lacking.

Service: Evaluating drought conditions at temporal and spatial resolution to predict fire vulnerability by building regional adaptive capacity and resilience for fire impact prevention

Fire Vulnerability: Fire season severity indices (Ranging from 0-100) for each area / contracting predicted index to observed data
S2s has the potential to predict the onset, evolution and decay of some large-scale extreme events several weeks ahead.

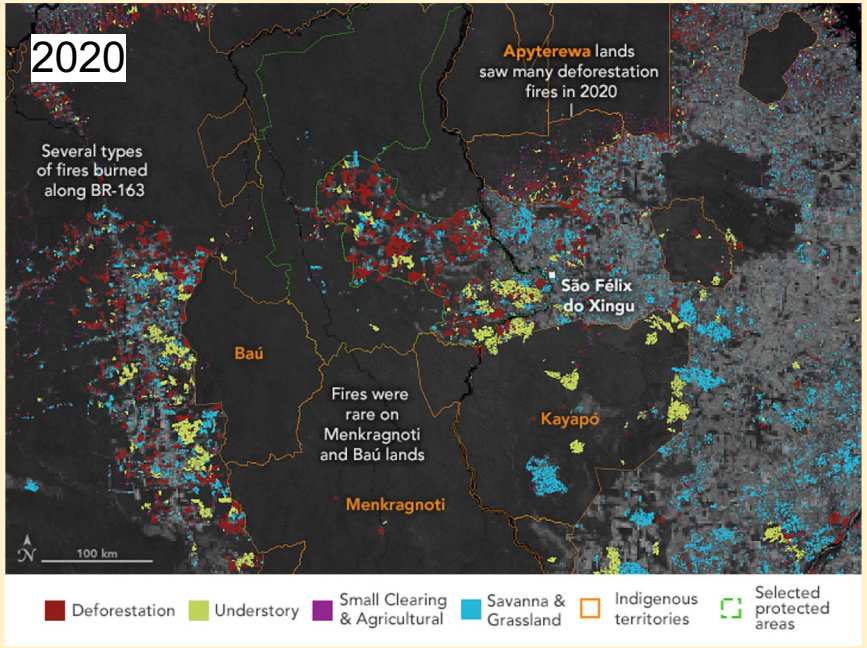
Co-developers: Servir Amazonia • Goddard Space Flight Center (NASA/AST D. Morton) • Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM) (Geo Principal Organization) • Secretaria de Estado de Meio Ambiente (SEMA-Acre) • Centro Gestor e Operacional do Sistema de Proteção da Amazônia (CENSIPAM).

Using several satellite platforms, including VIIRS and MODIS.



This dashboard predicts fire season severity for 2022 for the dry season and in high biomass burning regions of southern Amazonia.

Communitarian Action Responding to Current Threats in Brazil



Baú and Menkragnoti lands are patrolled by indigenous groups that actively resist land development from outsiders

Limited enforcement of land-use rules and the proximity to Apyterewa territory had large numbers of fires

- Help to understand what types of fires are burning, where they are burning, and how much risk/vulnerability those fires pose to the rainforest in weeks ahead.
- The Amazon dashboard team at NASA hopes that by making data publicly available stakeholders are able to use it to respond more effectively to fires and to moderate potential damages due to climate change.
- Reversing this trend is critical for the future of climate-buffering Amazon forests and the success of the Paris Agreement.

Fires in the Pantanal, Brazil, 2020

Early Warning Systems - Forecasting

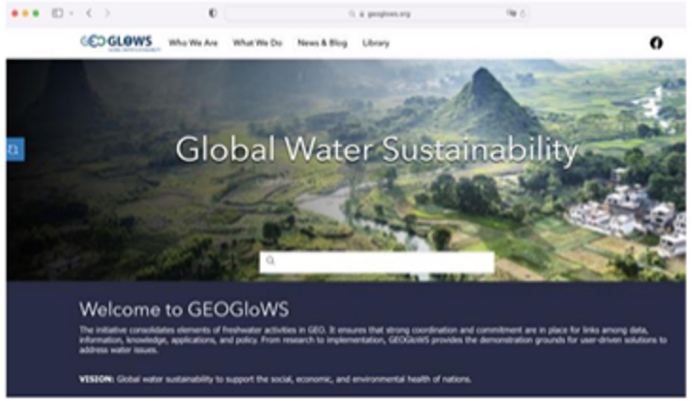
Improving Resilience and Reducing Risk of Extreme Hydrological Events in LAC

Geo Initiative since 2017. GEOGlows provides hydrologic runoff forecasts through an accessible web service to assist local water users for free

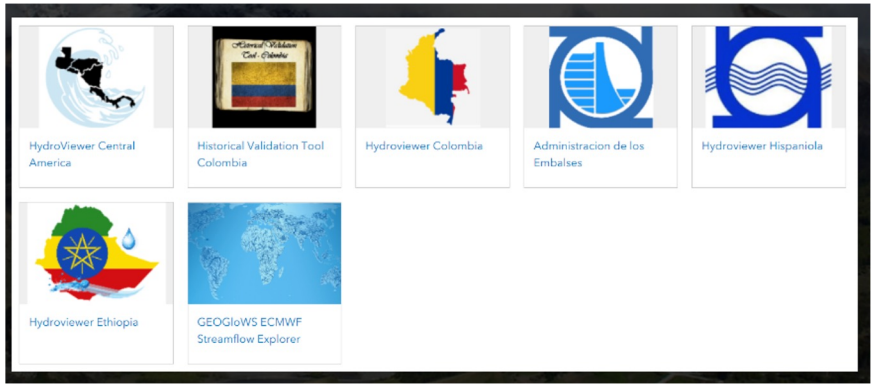
Gap: The implementation of this Early Warning Service responds to water requirements identified within the NAPs of Latin American countries within water needs.

Models are expensive to create, can require specialised equipment or skills, and are difficult to program. Lack of data sharing in transboundary watersheds

Service: Its combination of modern computing technologies with hydrologic sciences and satellite datasets enabled by web services and cloud computing. Customized applications to each stakeholder needs.



Geoglows Streamflow Forecasting tool



Subsets of river flow data for download (out of every river in the world)

Daily 15day ensemble forecasts

40+ year historical simulation

Custom styled and animated mapping of river flows, in-sito bias correction

Hydroviewer

Co-developers: BYU is a glue for successful partnerships between USAID-NASA-SERVIR ECMWF, NOAA, the World Bank, ESRI, AmeriGEO and Others. Users: IDEAM, Colombia. SICA CRRH ,Central America. INDRHI, Dominican Republic. SENAMHI, Peru. INAMHI, Ecuador.

GEOGLOWS
GLOBAL WATER SUSTAINABILITY

Reduced storm loss and damage in Honduras in 2020

Better management for flooding, and that means more warning time and less damage and loss of life

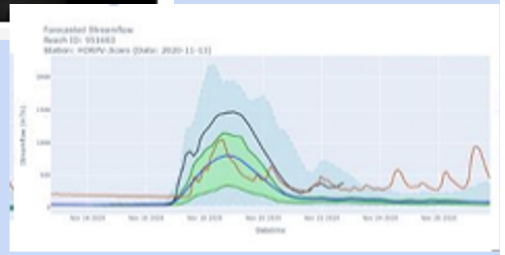
What ENEE did?

- Projected the potential water levels of the reservoir discharges for controlled discharges
- Made a series of low water releases of reservoir in the El Cajón Dam towards the Sula Valley
- Continuously monitored and validated the forecast in real time as the hurricane hit the land
- Provided information to disaster organizations
- COPECO and SINAGER/CENEPRED were able to develop contingency and evacuation plans for affected communities using ENEE's information which was based on the GEOGloWS forecast.

Between 3 and 17 November 2020/ Iota Category 5

ENEE National Electric Energy Company

In climate change response and disaster preparedness and mitigation, accurate streamflow indicators and forecasts play an increasingly important role in flood and drought control.



Steamflow (m3/s) vs Date

Impacts

$3,792 m
Hurricane Mitch (Category 5) in 1998

>

- 40%

$2,171 m
Hurricanes Eta & Iota

Earth Observations Risk Toolkit

Identify Essential Life Support Area

Mapping Nature for People and the Planet implementing ELSA methodology for Costa Rica's NAP

These are places where action to protect, manage, and restore nature can sustain critical benefits to humanity harmonizing nature and development policy.

Gap: Although earth observations are available and have potential to support national policy many countries are not utilizing them for decision-making

Service: To develop the adaptation approach, the following mapping objectives were taken into account:

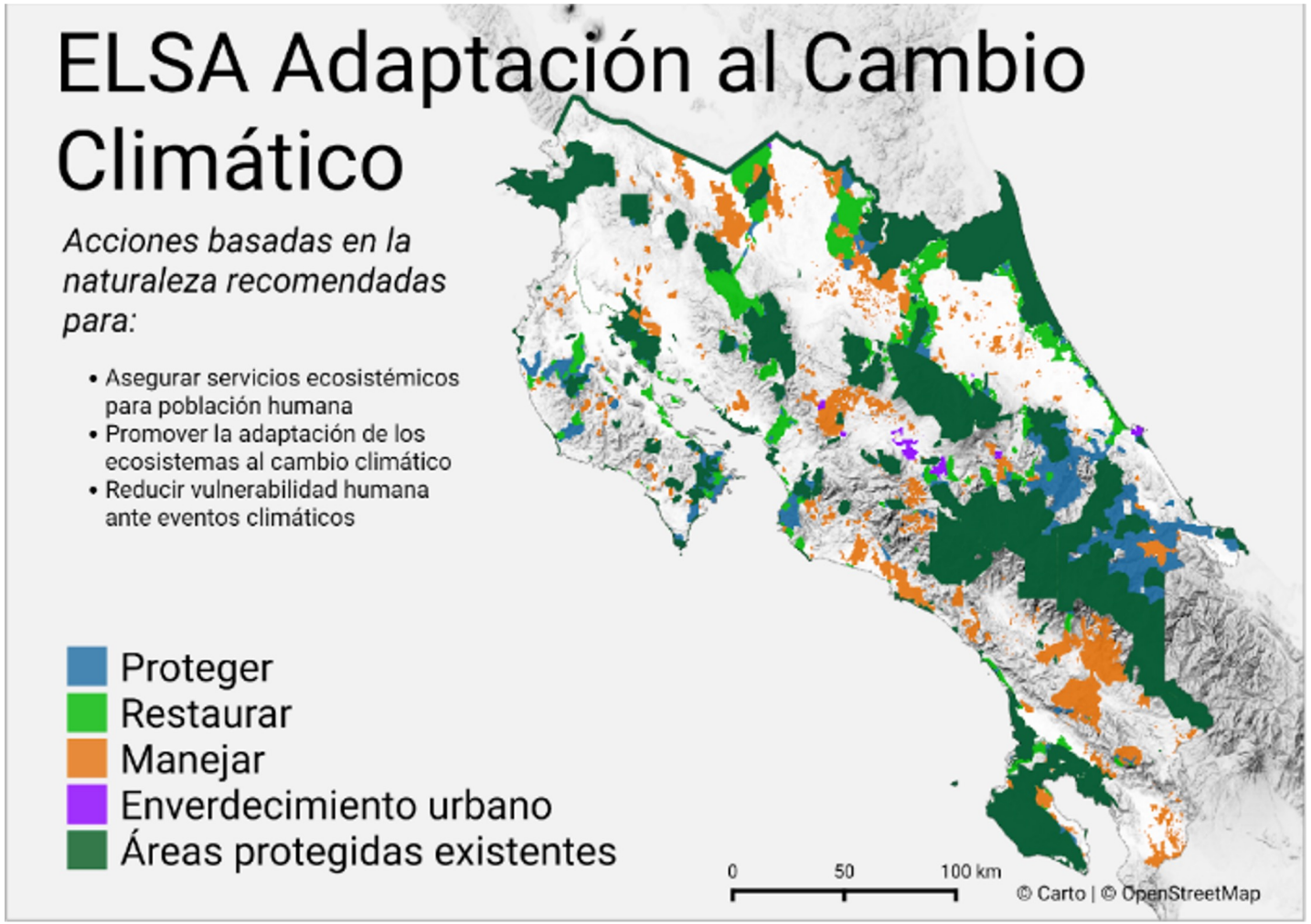
- "Reduce Human Vulnerability to Climate Events".
- "Promote Ecosystem Adaptation to Climate Change".
- "Ensure Ecosystem Services for Human Population".

the state of the art of the geospatial information available in the country was carried out to characterize the different policy objectives.

Co-developers: The United Nations Development Program (UNDP), MINAE (Geo Principal), Prias Lab, Global Environment Facility, the Gordon and Betty Moore Foundation, One Earth, Northern British Columbia University,

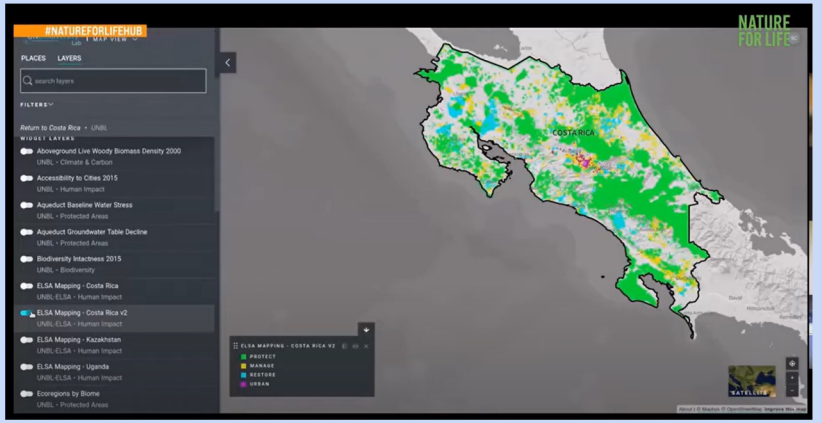
Global and National Geospatial Maps

- Mapping Hope: An approach to Identify Essential Life Support Areas for Climate Change
- Four different nature-based actions: Protection, restoration, management and urban greening which are included as specific action in the NAP .



Geo Portals

[UN Biodiversity Lab (UNBL)]



[PRIAS Lab National Territorial Information System]

Other Examples supporting Adaptation

Engagement of Stakeholders and Partnership for Capacity

- LACI - The Initiative for Enhancing Capacity for Climate Risk Assessment and Catalyzing Partnerships

Communication with Local Communities and Indigenous people for forest protection in the Amazon

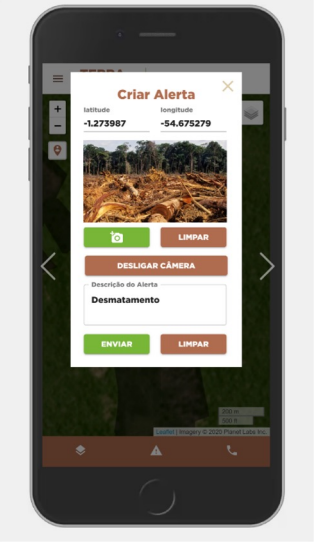
- The TerraOnTrack app to quickly identify potential threats to their territories and monitor illegal activities on the ground
- Understanding the geographic reality, perspective, and environmental and climatic knowledge of the Indigenous participants using EO Dashboard in Peru and Brazil.'

Urban Resilience in Ecuador

- Strategies to reduce hydroclimatic risk (RESCLIMA) to increase Urban resilience

Monitoring and Respond

- The COSTA program to tain and help with oil spill prevention
- Forest Carbon Monitoring SilvaCarbon & SCAP
- Deforestation Monitoring and Reporting by improving the Measurement, Reporting and Verification (MRV) system in Ecuador



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GROUP ON EARTH OBSERVATIONS

NAPEXPO CHILE 2023

Virginia Burkett, USGS, AmeriGEO

Chief Scientist for Climate and Land Use Change, International Programs at the United States Geological Survey (USGS).

Virginia is the US alternate representative to the Executive Committee of GEO and Co-chair of the GEO Climate Change WG.

She has published extensively on the topics of global change and low-lying coastal zones. Virginia was a Lead Author of the IPCC Third, Fourth and Fifth Assessment Reports and the IPCC Technical Paper on Water. She also was a Lead Author of the First, Second, and Third U.S. National Climate Assessments and she served on the Federal Steering Committee for the Fourth National Climate Assessment (2018).

Katia Kontar, USGCRP AmeriGEO

Dr. Yekaterina "Katia" Kontar is affiliated with AmeriGEO.

She serves as the International Lead at the U.S.Global Change Research Program (USGCRP). She coordinates USGCRP interagency activities to promote international cooperation on global change research. Katia's research background and expertise lie in the fields of natural hazards and risk reduction and Arctic resilience.

LACI

The Initiative for Enhancing Capacity for Climate Risk Assessment and Catalyzing Partnerships to Inform Decisions in Latin America and the Caribbean

Mejorar la Capacidad de Evaluación de Riesgos Climáticos y Catalizar Alianzas para Informar Decisiones en América Latina y el Caribe

Collaborative Effort, grounded in **co-design**

- Partnership building & fostering
- Peet-to-Peer learning & training
- Data synthesis & analysis

Phase 1 (Scoping): 14 countries identified priorities & capacities in addressing climate impact

Phase 2: Pilot Co-Design

AmeriGEO Earth Observations for the Americas

30 years IAI

U.S. Global Change Research Program

USGEO United States Group on Earth Observations

Progress to Date

Phase 1: Scoping

Partnership Building

Landscape Mapping

2 Workshops

2 Surveys

In-depth NAPs Analysis

Phase 2: Pilot Co-Development

9 Pilot concepts from 10 countries submitted

Concepts stock take

4 Pilot clusters formed

4 Task Teams stood up

Continuous regional engagement

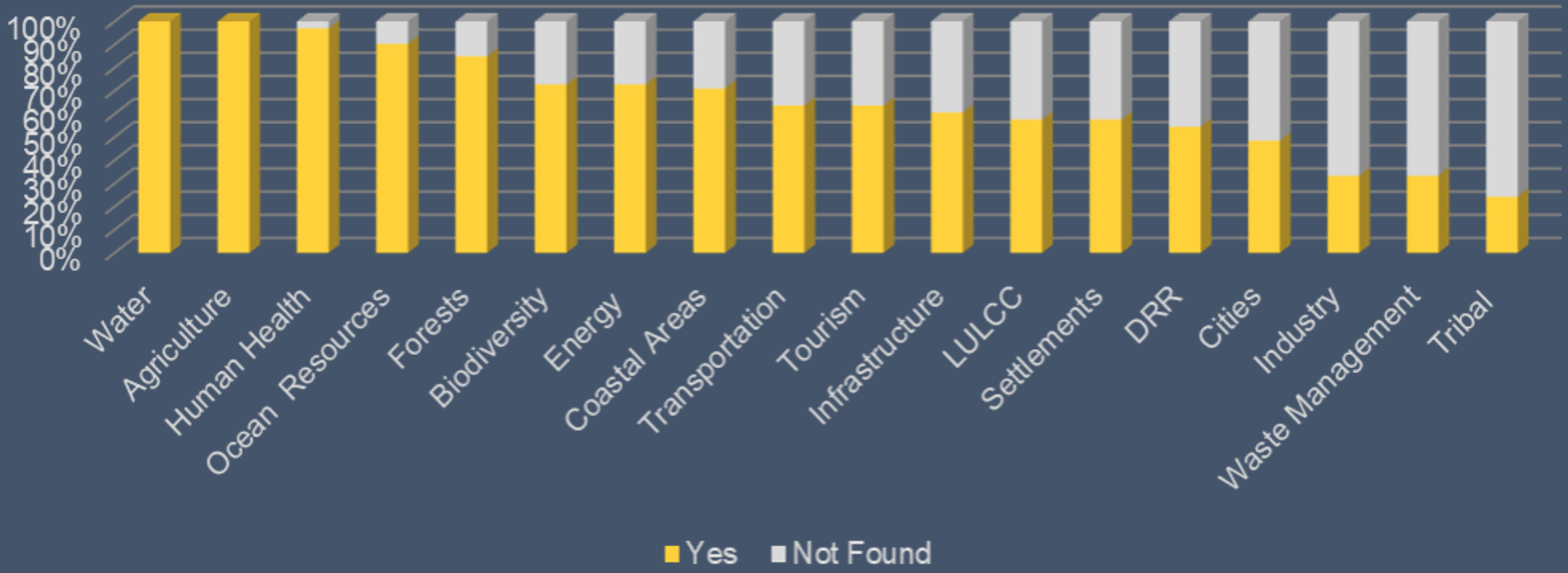
Pilot activities co-design

Nov 2021 | Aug 2022 | Sept 2022 | Oct 2022 | Nov 2022 | Dec 2022 | Jan 2023 | Feb 2023 | Mar—Jun 2023

Review of Climate-Related Documents in the LAC Region

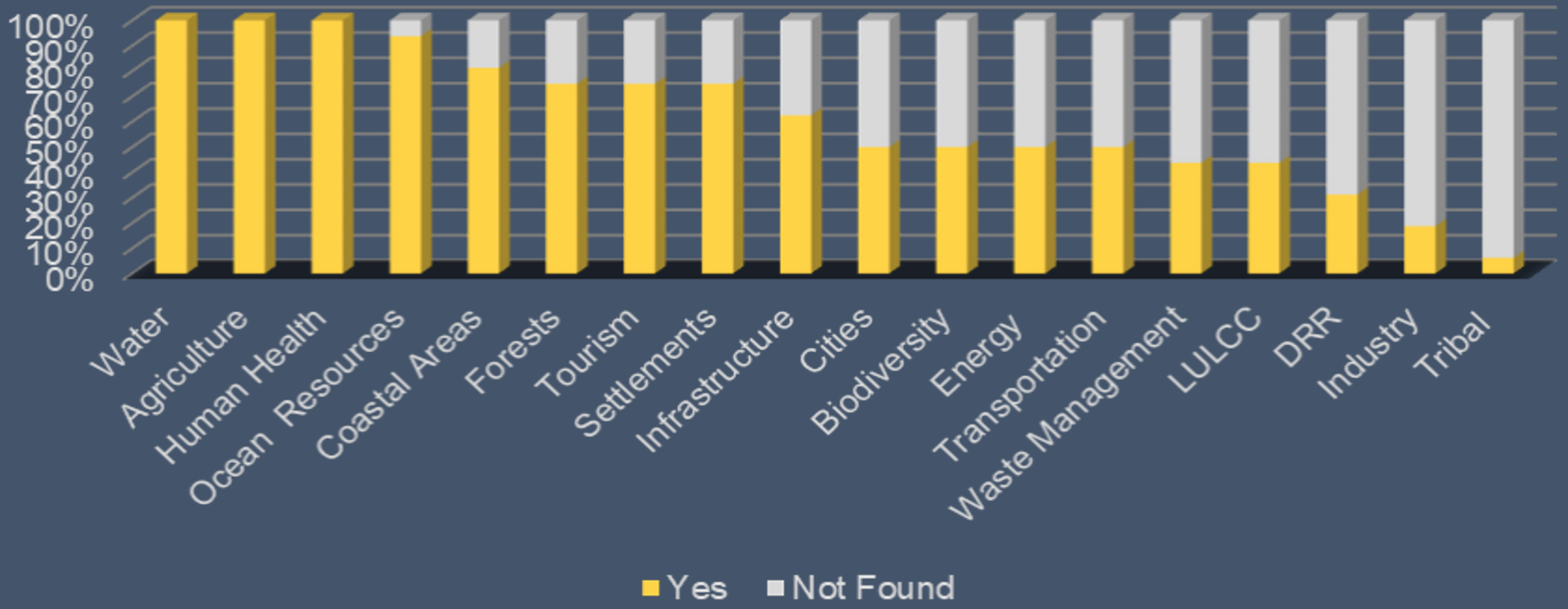
- ✓ Assessments
- ✓ National Communications to the UNFCCC
- ✓ National Adaptation Plans, including sectoral plans
- ✓ Climate change strategies and framework policies
- ✓ National development plans

Adaptation Priorities by Sector



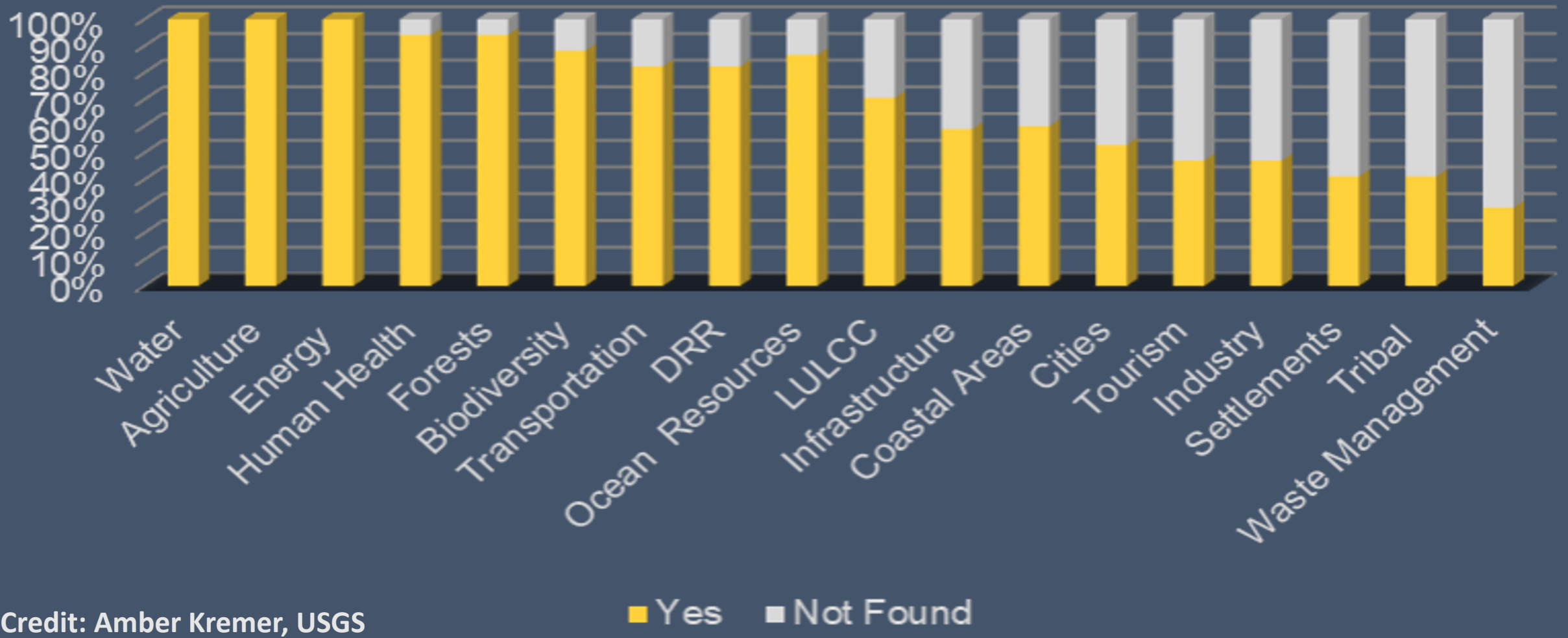
Credit: Amber Kremer, USGS

Adaptation Priorities in the Caribbean



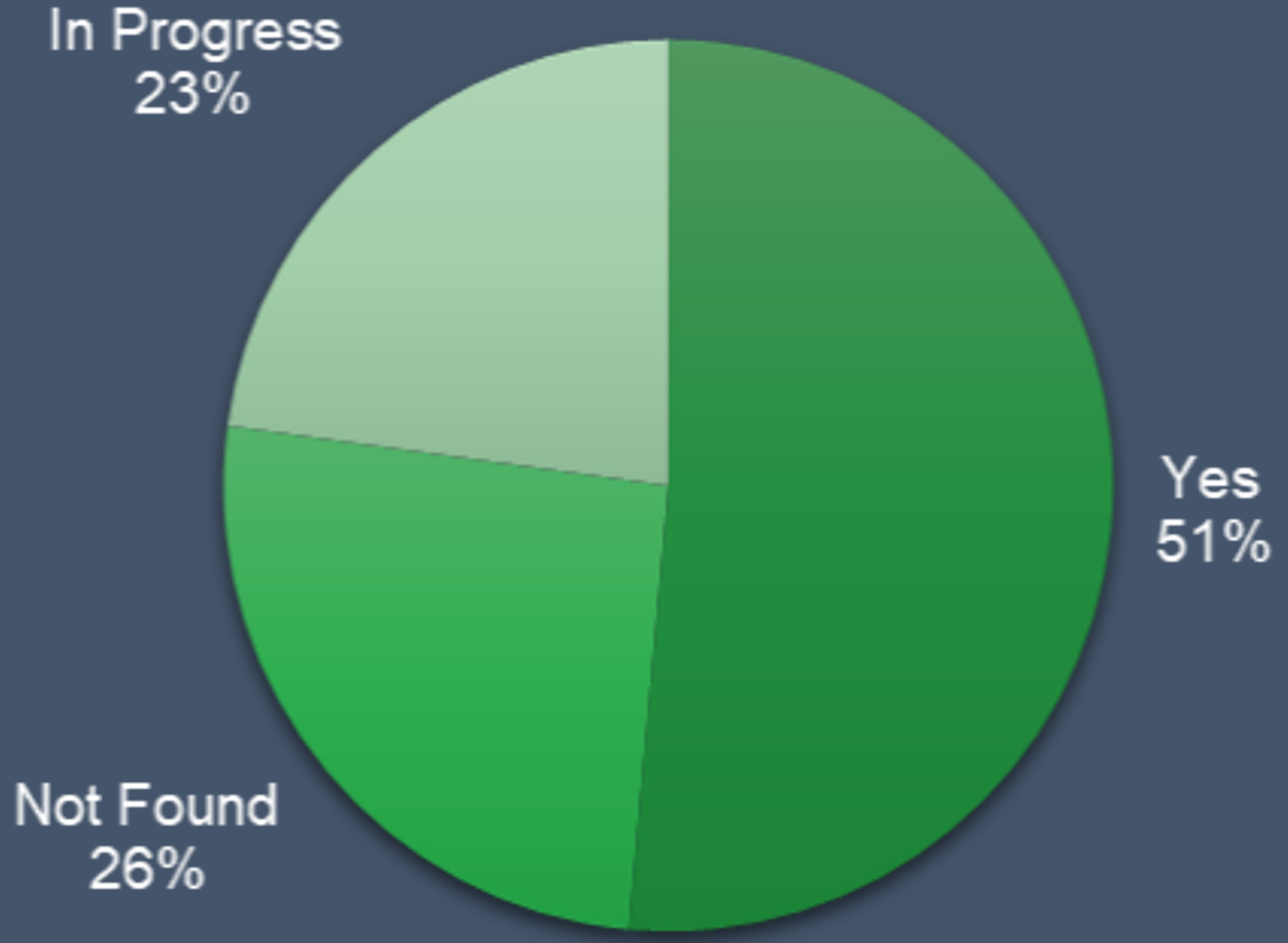
Credit: Amber Kremer, USGS

Adaptation Priorities in Latin America



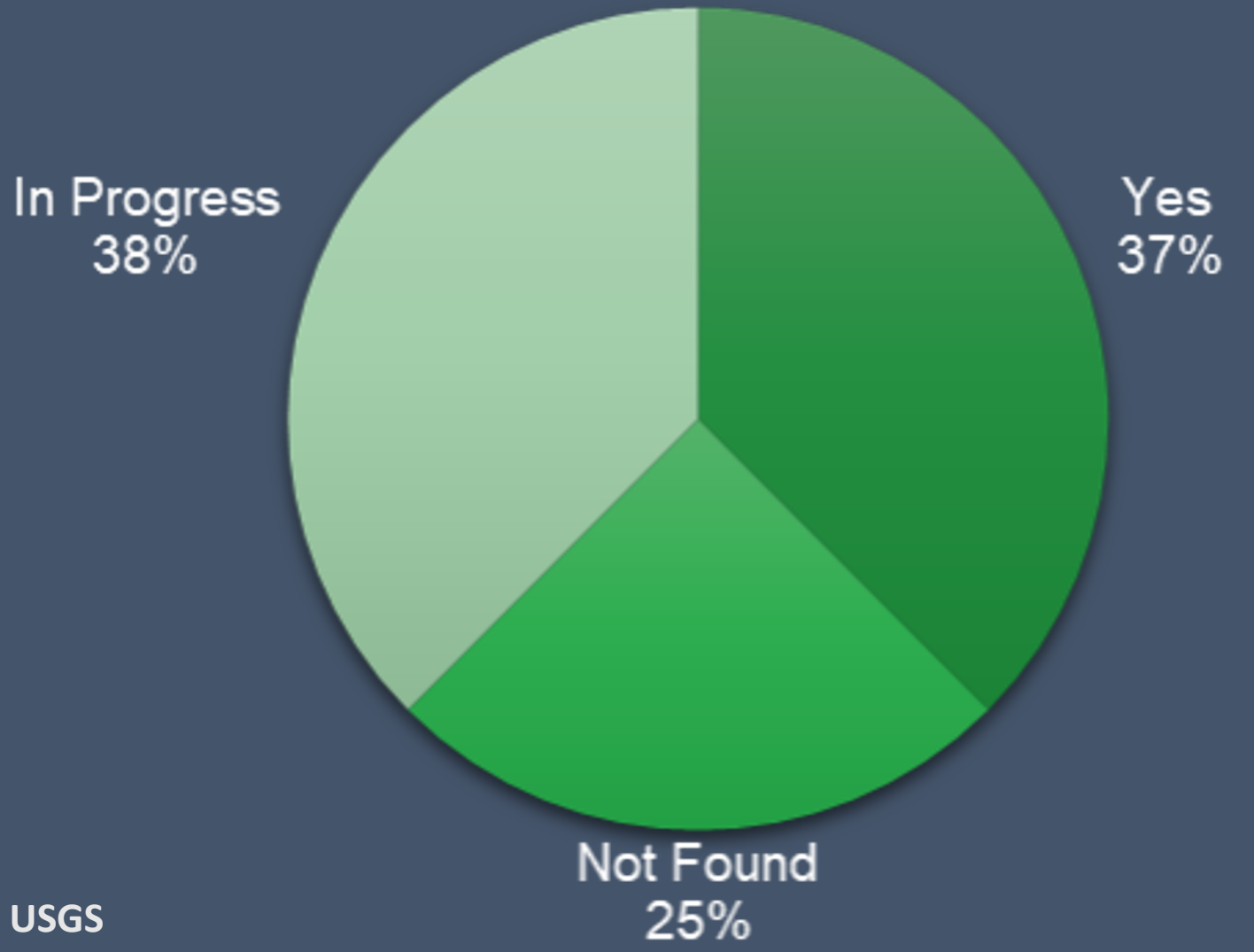
Credit: Amber Kremer, USGS

NAPs Completed in LACI Region



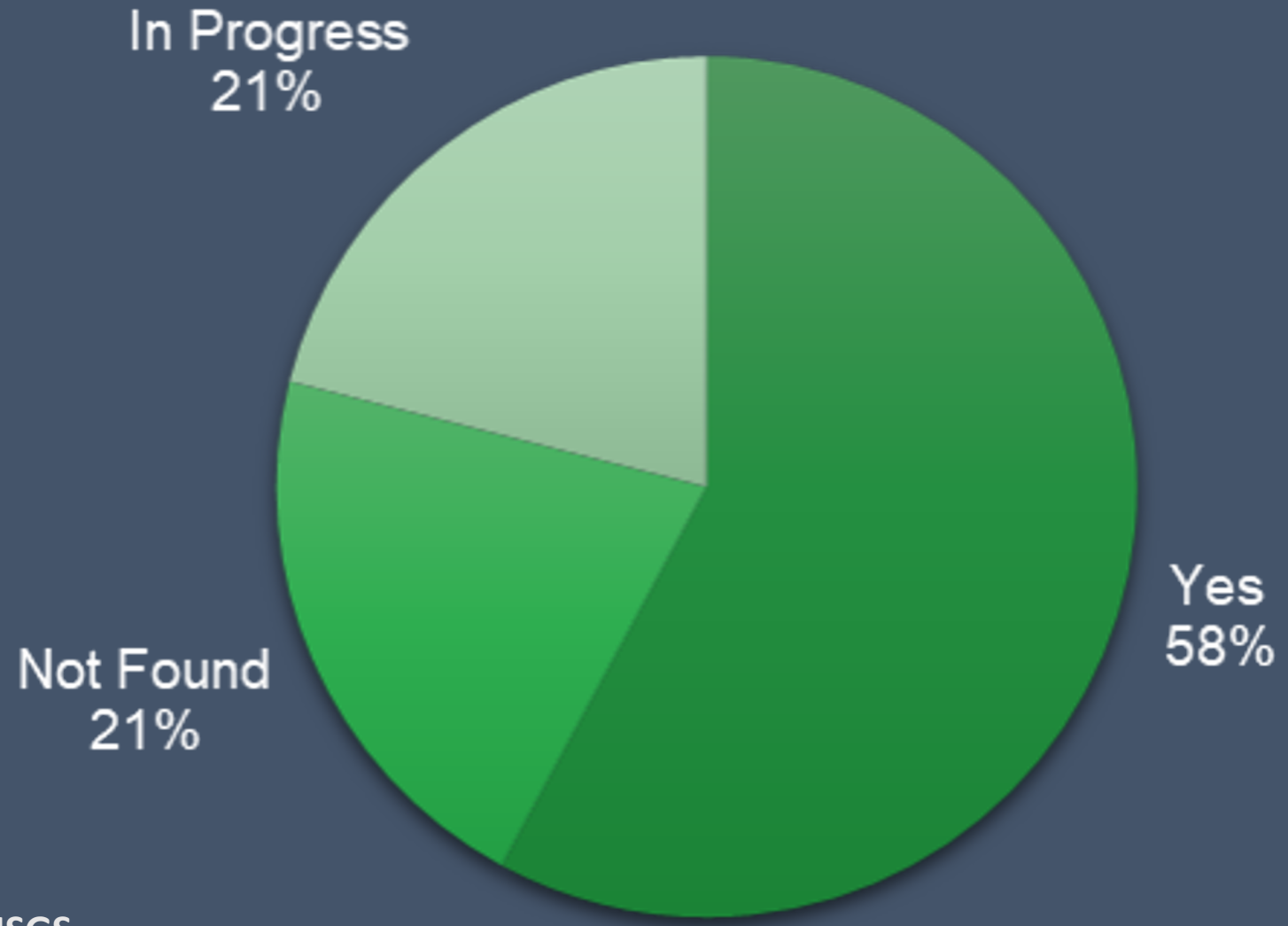
Credit: Amber Kremer, USGS

NAPs in the Caribbean Region



Credit: Amber Kremer, USGS

NAPs in Latin America



Credit: Amber Kremer, USGS

Synthesis of Climate Documents - Barriers to Building Climate Resilience

- Technology transfer
- Lack of data, methods and protocols for data sharing
- Lack of coordination across stakeholders & sectors
- Climate policy barriers
- Financing

Progress to Date

Phase 1: Scoping

Partnership Building

Landscape Mapping

2 Workshops

2 Surveys

In-depth NAPs Analysis

Phase 2: Pilot Co-Development

9 Pilot concepts from 10 countries submitted

Concepts stock take

4 Pilot clusters formed

4 Task Teams stood up

Continuous regional engagement

Pilot activities co-design

Nov 2021 | Aug 2022 | Sept 2022 | Oct 2022 | Nov 2022 | Dec 2022 | Jan 2023 | Feb 2023 | Mar—Jun 2023

Stock take: guiding considerations

- Alignment with the LACI vision
- Concise statement of knowledge challenge/gap, and how this activity would address the gap
- Strong DEI component
- Scalability and relevance
- Endorsement by/affiliation with the UNFCCC focal point
- Availability of applicable data/information/tools/methods/resources

Concepts 1-9 Synopsis Overview

Identifying common priorities & grouping available resources

- Participating countries
- Climate resilience or climate knowledge challenge/gaps
- Key actions
- Local resources needed
- Potential Regional resources/agencies

LACI 2023-2024

4 Task Teams formed to co-design Pilot activities

SRI 2023 - Pilots Announcement

Panama City, Panama, June 26-30

AmeriGEO Week

San Jose, Costa Rica, Aug 7-11

UNFCCC COP 28

Dubai, United Arab Emirates, Nov 30-Dec 12, 2023

Contacts

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GEO GROUP ON EARTH OBSERVATIONS

NAPEXPO CHILE 2023

Open discussion

- What is new and truly innovative in your approach to adaptation using Earth observations?
- How to effectively merge Earth observations with other data, for instance, socio-economic and traditional knowledge?
- What capacity building is needed to make sure that data is applicable to national needs and priorities for adaptation?