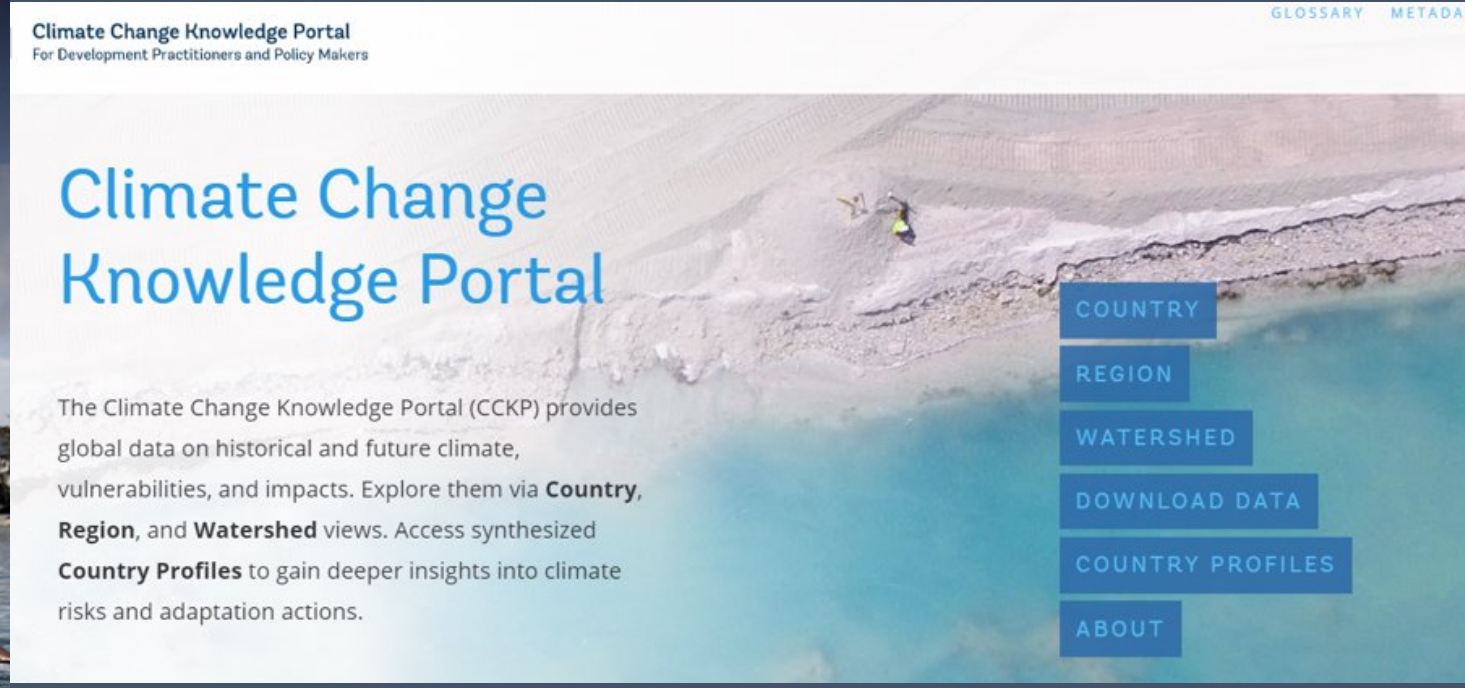

GEF & WBG Climate Risk Screening & the Climate Change Knowledge Portal (CCKP)

https://climateknowledgeportal.worldbank.org

Ana Bucher
MacKenzie Dove
Viviane Clement

WORLD BANK GROUP
Climate Change

gef

Objectives

To share WBG approaches and tools to aide project teams in collecting best available information that can be used to perform climate screenings.

Agenda

1. WBG Risk Screening Process
2. GEF Screening Process
3. Project Example
4. Walk-through of the CCKP
5. Additional Resources

World Bank Group Risk Screening: 4-Logic Steps

Step 1 — Hazard Exposure

Step 2 — Potential Impact

Step 3 — Adaptive Capacity

Step 4 — Project Risk

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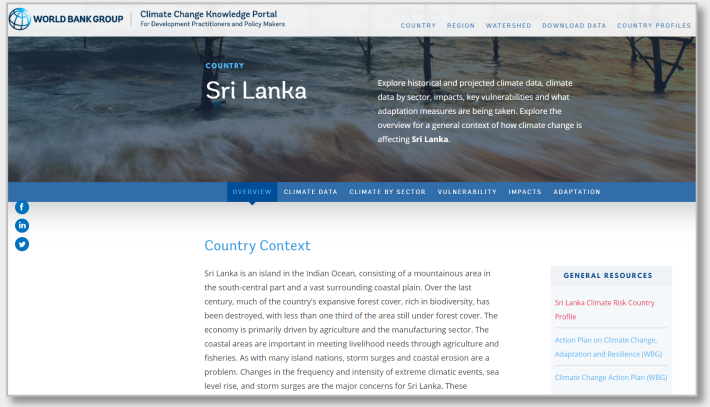
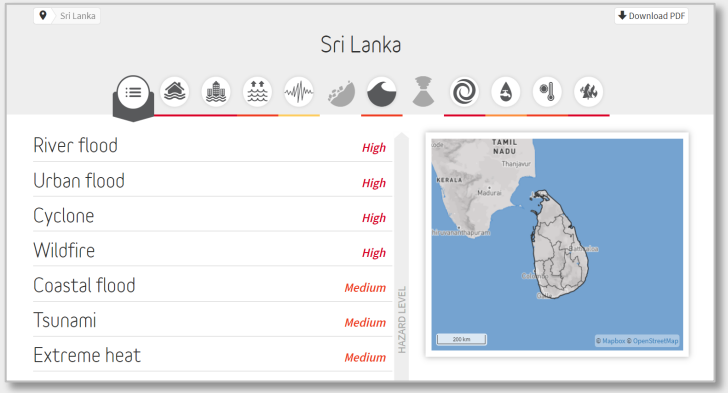
World Bank Group Climate and Disaster Risk Screening Process

WBG resources embedded in the tools

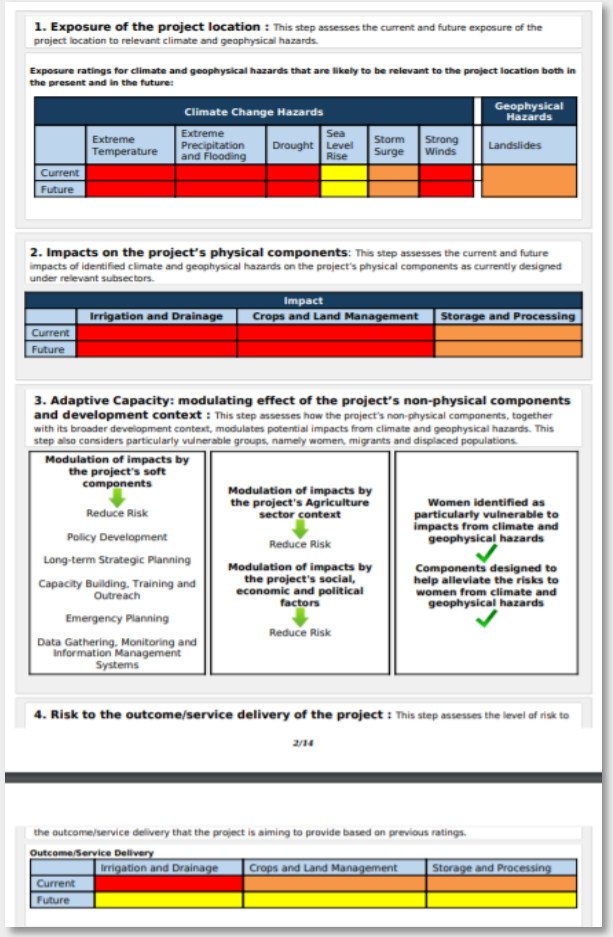
CCKP:



ThinkHazard:



Climate and Disaster Risk Screening Report



1. Exposure of the project location : This step assesses the current and future exposure of the project location to relevant climate and geophysical hazards.

Exposure ratings for climate and geophysical hazards that are likely to be relevant to the project location both in the present and in the future:

	Climate Change Hazards						Geophysical Hazards
	Extreme Temperature	Extreme Precipitation and Flooding	Drought	Sea Level Rise	Storm Surge	Strong Winds	Landslides
Current							
Future							

2. Impacts on the project's physical components: This step assesses the current and future impacts of identified climate and geophysical hazards on the project's physical components as currently designed under relevant subsectors.

	Impact		
	Irrigation and Drainage	Crops and Land Management	Storage and Processing
Current			
Future			

3. Adaptive Capacity: modulating effect of the project's non-physical components and development context : This step assesses how the project's non-physical components, together with its broader development context, modulates potential impacts from climate and geophysical hazards. This step also considers particularly vulnerable groups, namely women, migrants and displaced populations.

Modulation of impacts by the project's soft components	**Modulation of impacts by the project's Agriculture sector context**	**Women identified as particularly vulnerable to impacts from climate and geophysical hazards**
Reduce Risk	Reduce Risk	✓
Policy Development	**Modulation of impacts by the project's social, economic and political factors**	**Components designed to help alleviate the risks to women from climate and geophysical hazards**
Long-term Strategic Planning	Reduce Risk	✓
Capacity Building, Training and Outreach		
Emergency Planning		
Data Gathering, Monitoring and Information Management Systems		

4. Risk to the outcome/service delivery of the project : This step assesses the level of risk to

2/14

the outcome/service delivery that the project is aiming to provide based on previous ratings.

Outcome/Service Delivery

	Irrigation and Drainage	Crops and Land Management	Storage and Processing
Current			
Future			

How this information can translate into action

After screening, the task team considered moderate to high exposure risks associated with extreme heat, droughts, floods, landslides, storm surge and strong winds.

Excerpts from the PAD:

"…exposure is **rated High. The districts under this project are in the dry zone, and some are coastal. They are vulnerable to the impacts of floods, drought, high winds/cyclones, and storm surge.** Droughts hit these districts every 3–4 years and create significant livelihood impacts. … The rehabilitated irrigation infrastructure will follow improved designs taking account of the increased rainfall intensities. The rehabilitation of small tank systems will consider to the extent possible the potential impact of floods and droughts, and the designs will be undertaken accordingly. Climate-resilient farming practices, such as drought/flood-tolerant crop varieties, improved water management practices, catchment management, crop diversification, and so on, will reduce the impact of extreme events.

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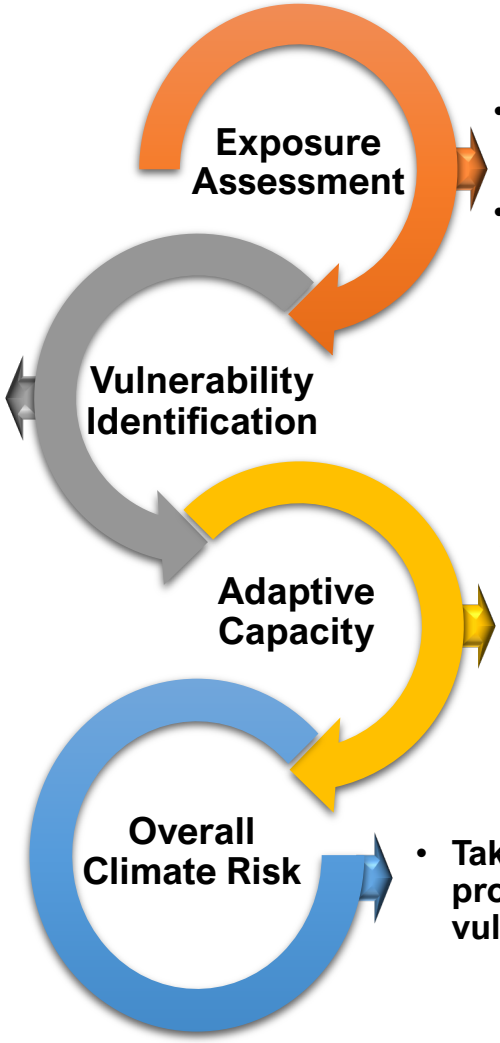
GEF Climate Risk Assessment

Steps in climate risk assessment

IPCC definitions

- **Risk:** potential for adverse consequences where something of value is at stake and associated with uncertainties.
- **Vulnerability**: propensity to be adversely affected encompassing sensitivity to harm and inability to cope.

Assessing Climate Vulnerability



- Of the project location and proposed interventions or project components.
- Historical and projected climatic conditions (climate variability).

- Sensitivity of project location and proposed interventions to identified climate exposure and ability to cope.

- How resilient are the resources at the project location?
- Is resilient built into the proposed project interventions/components?

- **Taken together, to what is the project location and proposed interventions or project component vulnerable, and to what extent?**

STAP's Climate Risk Screening Question

- Has the **sensitivity to climate change**, and its impacts, been assessed?
- How will the project be affected by climate **risks over the period 2020 to 2050**, and have the impacts been addressed adequately?
- Have measures to **address the risks** been considered? How will these risks be dealt with?
- What **technical and institutional capacity**, and information is needed?

GEF Project Example

Six Project Sites:

GOOD PRACTICE BRIEFS—2019/3

gef GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

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Integrated Coastal Watershed Conservation

Cross-sectoral and participatory conservation, and monitoring in the context of climate change in Mexico

PROJECT FULL NAME	COUNTRY & REGION	IMPLEMENTING AGENCY	World Bank
Conservation of Coastal Watersheds to Achieve Multiple Global Environmental Benefits in the Context of Changing Environments	Mexico, Latin America	EXECUTING AGENCIES	National Commission for Protected Areas (CONANP), National Forestry Commission (CONAFOR), National Institute of Ecology and Climate Change (INECC), and a private institution, the Mexican Fund for the Conservation of Nature (FMCN).
GEF PROJECT ID: 4792	FOCAL AREAS	09/09/2013 CEO Endorsement	06/28/2019 Project Closure
PROJECT TYPE: FSP	▪ Biodiversity, ▪ Climate Change Mitigation ▪ Land Degradation ▪ Sustainable Forest Management	06/01/2012 Project Approval	01/23/2017 Mid-Term Review
GEF PERIOD: GEF-5		GEF Project Grant $39,518,181	Co-financing Total $239,886,000

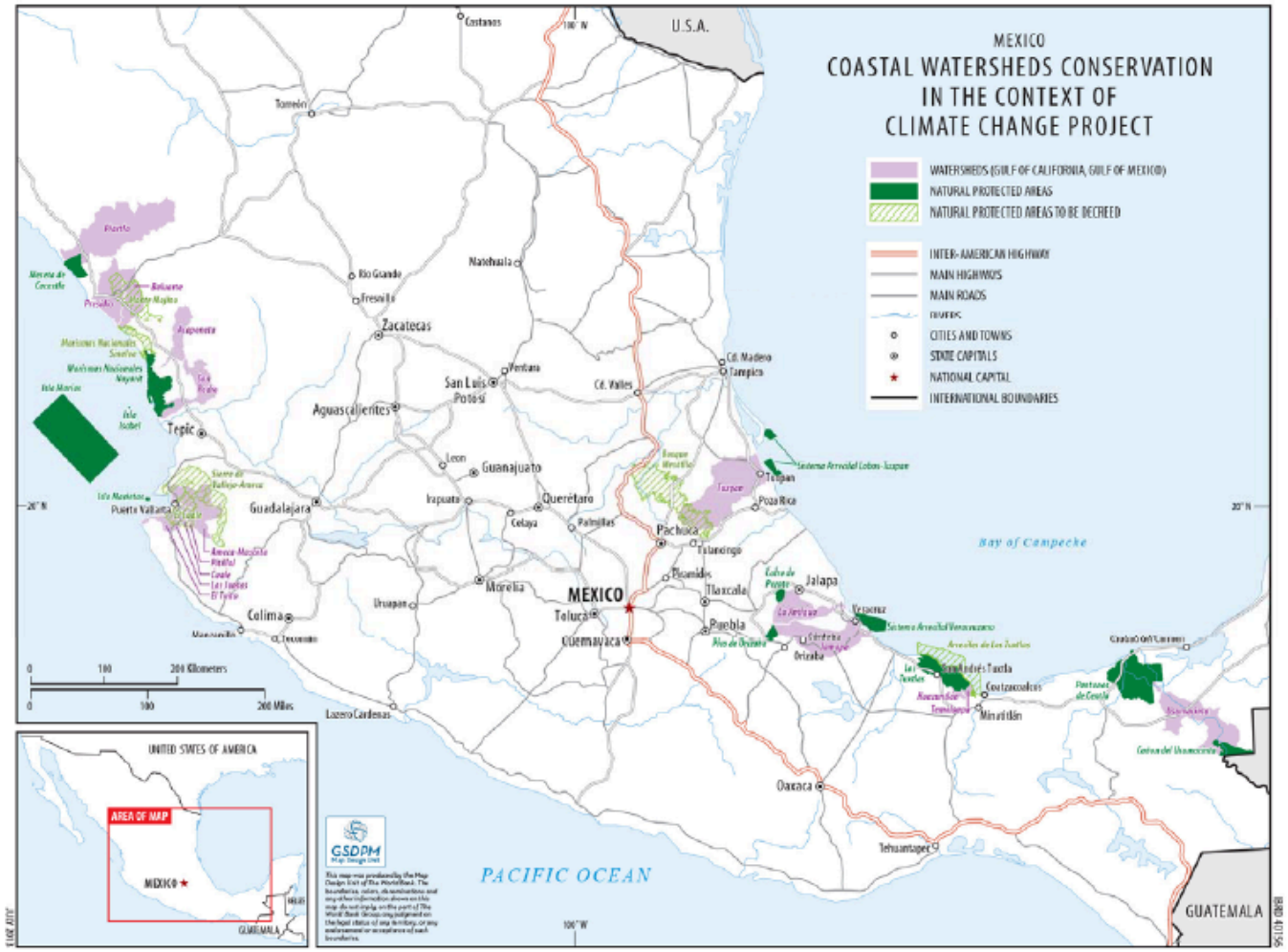
Summary

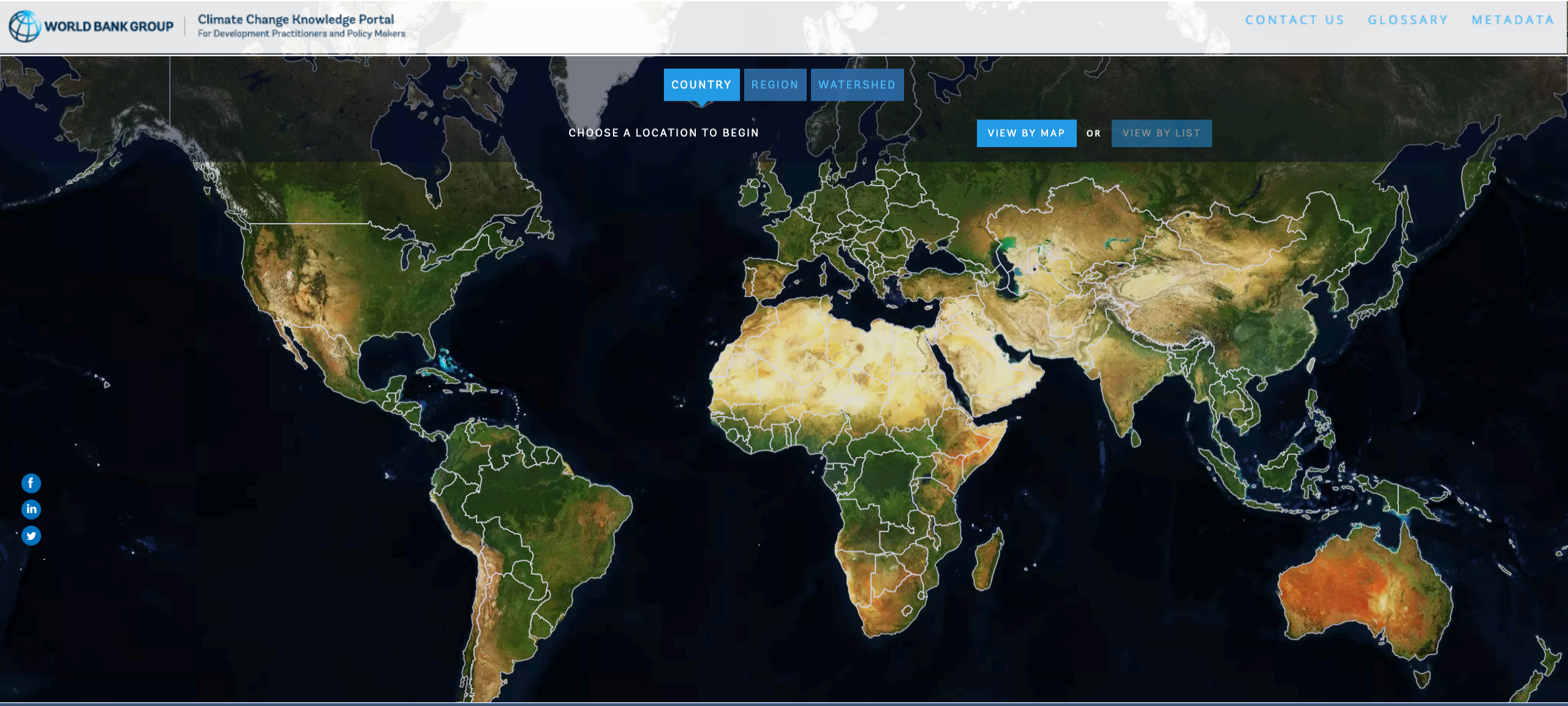
The project promotes integrated management of coastal watersheds to conserve biodiversity, contribute to climate change mitigation, and enhance sustainable land use in the Gulf of Mexico and Gulf of California, where impacts from climate change are significant and habitats of globally significant biodiversity are provided. Collaborating with three federal agencies and a private foundation, the project focused on improving sustainable management of protected areas and surrounding watersheds including the areas where local communities manage agroforestry systems. In addition, local communities were engaged through sub-projects that supported sustainable cattle ranching, honey production, adventure tourism and others. These same stakeholders were involved in project monitoring and development of the Integrated Watershed Action Plans. The project achieved improvement of protected areas management covering 1,748,204.73 hectares, improved management of productive landscapes in the watersheds covering 35,784 hectares, and due to the emphasis on community participation, strengthened socio-ecological resilience of the watersheds to climate change and other potential future environmental and social perturbations. Community pride and ownership in the sustainable management of watersheds was a key outcome. Based on all these outcomes, an integrated watershed management approach is being scaled up at the local and national level.

GEF Project Example

Project Objectives:
To promote integrated environmental management of selected coastal watersheds as a means to conserve biodiversity, contribute to climate change mitigation, and enhance sustainable land use.

Key Sectors:
Water Resources,
Biodiversity,
Forestry,
Agroforestry,
Environment Services





Using the CCKP for Climate Risk and Disaster Screening

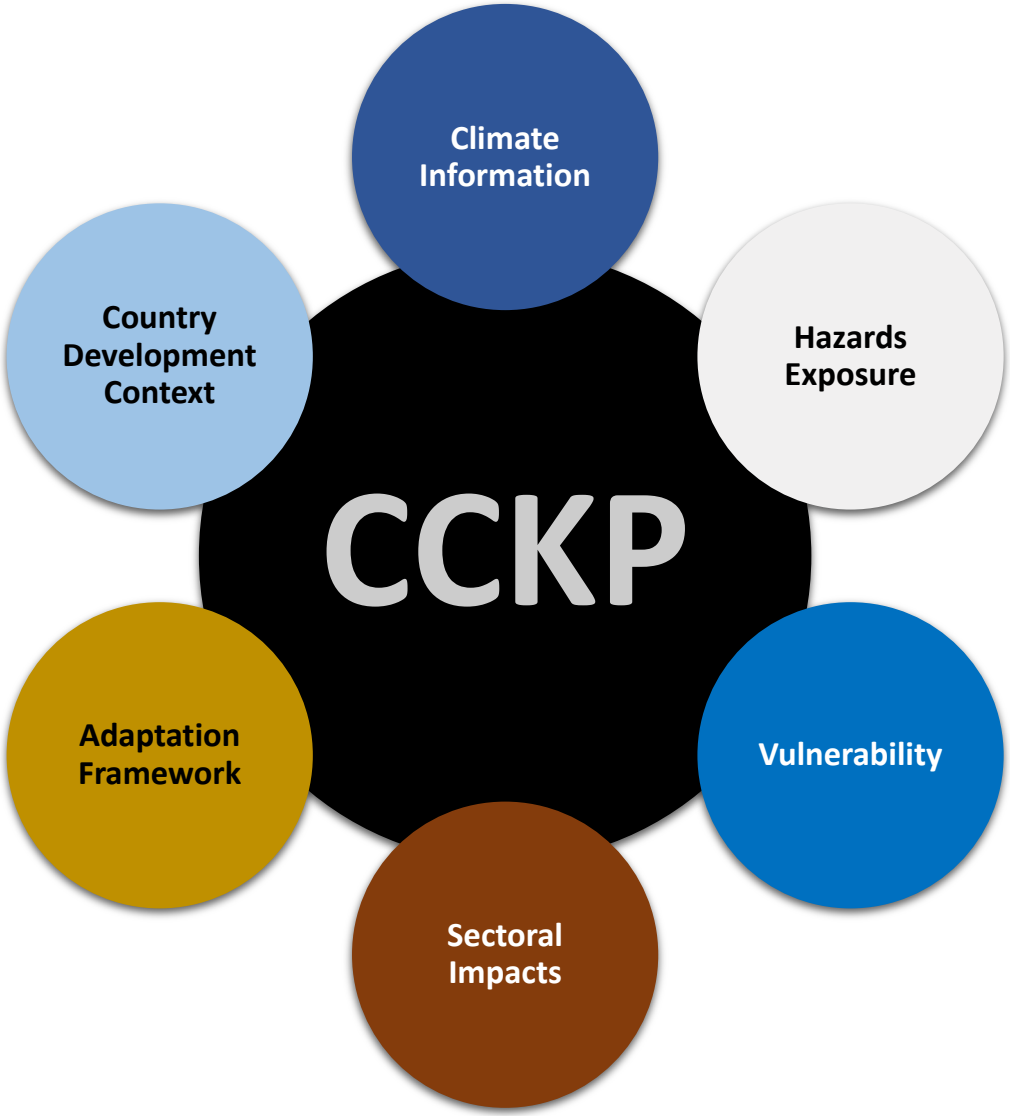
Short video

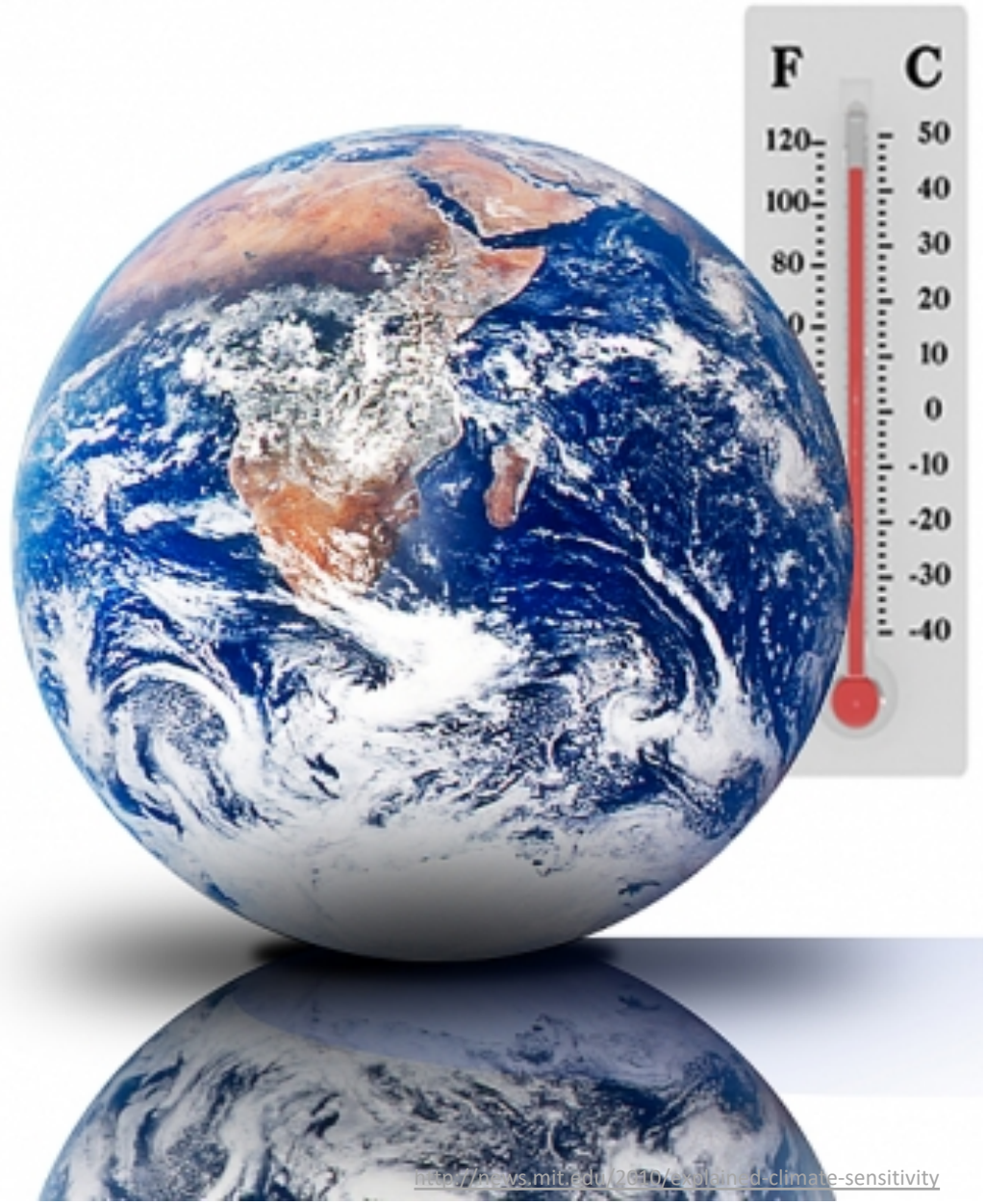
The World Bank created the Climate Change Knowledge Portal to solve a need

In an effort to serve as a 'one stop shop' for climate-related information, data, and tools, the World Bank created the Climate Change Knowledge Portal (or CCKP). The Portal provides an online tool for access to comprehensive global, regional, and country data related to climate change and development.

http://climateknowledgeportal.worldbank.org

Key Features of CCKP





http://news.mit.edu/2010/explained-climate-sensitivity

STAP's Question 1

Has the sensitivity to climate change, and its impacts, been assessed?

are the current and projected climate vulnerabilities at the project location identified?

Information that would be useful includes:

- Historical and projected climatic conditions
- Information on vulnerability to project climatic conditions
- Is climate change a driver of the targeted problem?
- Interactions between climate and non-climate stressors

Climate Data: Historical

Tailored Narratives

OVERVIEW | CLIMATE DATA | CLIMATE BY SECTOR | VULNERABILITY | IMPACTS | ADAPTATION

HISTORICAL | PROJECTIONS

Climate Data > Historical

The climate in Mexico varies, largely by altitude, with some areas experiencing desert-like conditions and others experiencing a more tropical climate. The northern part of the country experiences cooler temperatures and peak rainfall during the winter months. The southeast of the country experiences a tropical rainy climate that ranges from no dry season to a short dry season. El Nino events typically bring cool, wet conditions to northern Mexico (in winter), and La Nina bring warmer, drier conditions during this same period.

Temperature

- Mean annual temperature has increased by 0.6°C since 1960, at a rate of approximately 0.13°C per decade.
  The rate of increase is most rapid in the dry seasons (March-May and December-February) at a rate of 0.18-0.2°C per decade and slower in the wet seasons (June-August and September-November).

Precipitation

- Mean rainfall over Mexico does not show any consistent increase or decrease since 1960.
- A particularly wet autumn in 2004 caused an apparent increasing trend in

Historical Climate Trends

Aggregated country statistics

DATA SNAPSHOTS

Mean annual temperature is **20.57°C (1901-2016)**

Mean annual precipitation is **724.64mm (1901-2016)**

GENERAL RESOURCES

Tool: Climate Analysis, Monitoring and Forecasts (IRI)

Tool: Climatic Research Unit Climate Data (UEA)

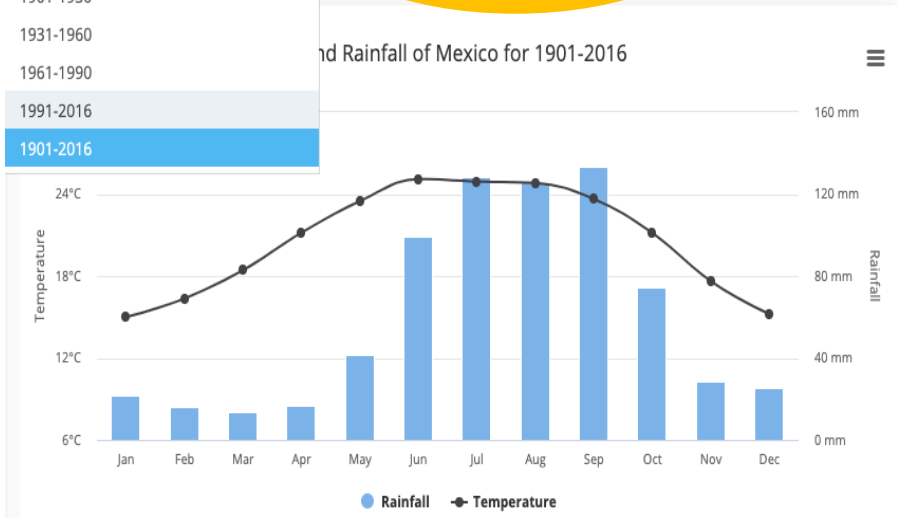
Tool: Historical Climate Variability Tool (WBG)

Different timeperiods

TIME PERIOD

1901-2016

1901-1930
1931-1960
1961-1990
1991-2016
1901-2016



Climate Data: Historical

Choose from Multiple Variables

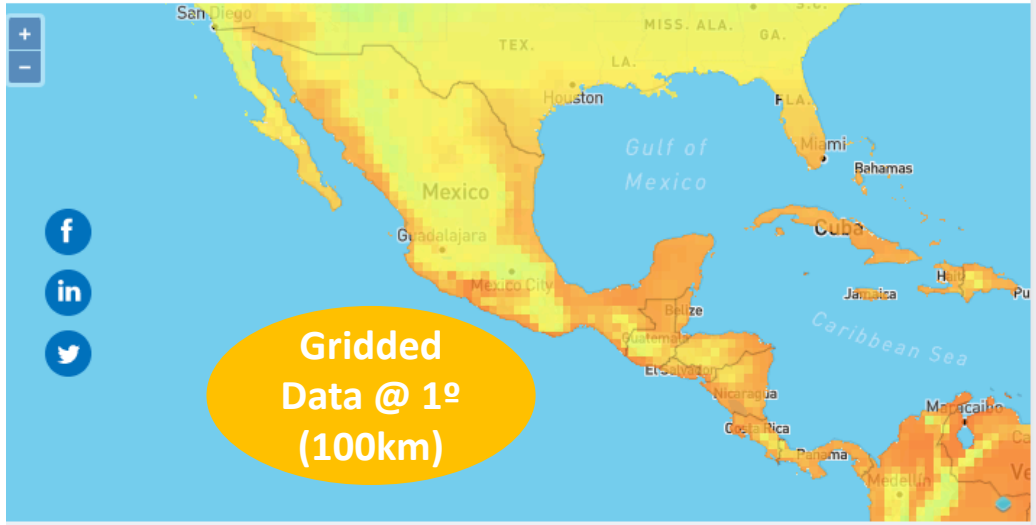
VARIABLE

Annual Temperature

TIME PERIOD

1991-2016

Annual Temperature of Mexico for 1991-2016



Gridded Data @ 1º (100km)

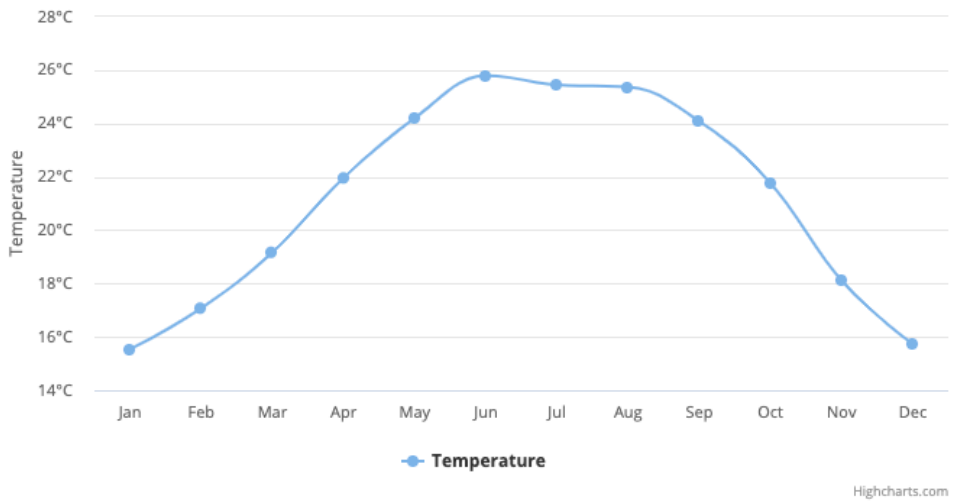
ANNUAL TEMPERATURE (˚C)

-60 -50 -40 -30 -20 -10 0 10 20 30 40

METADATA

Historical data is derived from four sources, all quality controlled by leading institutions in the field.

Average Monthly Temperature of Mexico for 1991-2016



It is important to evaluate how climate has varied and changed in the past. The monthly mean historical rainfall and temperature data can be mapped to show the baseline climate and seasonality by month, for specific years, and for rainfall and temperature. The chart above shows mean historical monthly temperature and rainfall for Mexico during the time period 1991-2016. The dataset was produced by the Climatic Research Unit (CRU) of University of East Anglia (UEA).

Climate Data: Historical

VARIABLE

Annual Precipitation

TIME PERIOD

1901-2016

Annual Rainfall of Mexico for 1901-2016

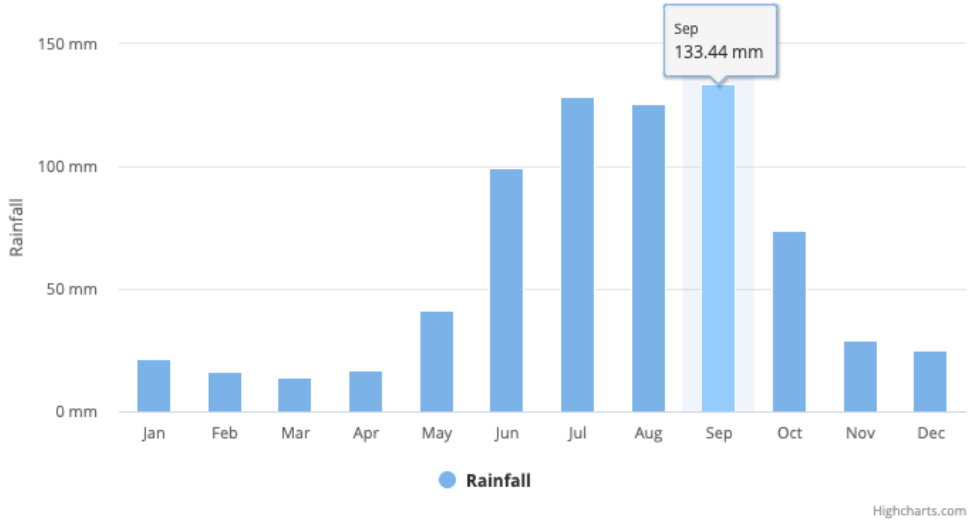
ANNUAL PRECIPITATION (MM)

0 20 50 100 200 500 1000 2000 3000 4000 5000 6000

METADATA

Historical data is derived from four sources, all quality controlled by leading institutions in the field.

Average Monthly Rainfall of Mexico for 1901-2016



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Climate Data: Projections

OVERVIEW | CLIMATE DATA | CLIMATE BY SECTOR | VULNERABILITY | IMPACTS | ADAPTATION

HISTORICAL | PROJECTIONS

Climate Data > Projections

The climate science community sources a suite of global climate models to help decision makers understand the projections of future climate change and related impacts, among the most widely used are the Coupled Model Intercomparison Project, Phase 5 (CMIP5) models included in the IPCC's Fifth Assessment Report (AR5). Climate projections can be presented via individual models or through multi-model ensembles. The Climate Change Knowledge Portal (CCKP) supports the analysis of climate impacts using multi-model ensembles, as they represent the range and distribution of the most plausible projected outcomes when representing expected changes.

Temperature

- Mean temperature is projected to increase by 1.1 to 3°C by the 2060's and by 1.3 to 4.8°C by the 2090's.
  The projected rate of warming is similar in all seasons, but more rapid in the north and central regions of the country.
- Annually, projections indicate that 18%-34% of days will be "hot" by the 2060's, and on 22%-54% of days by the 2090's.
- All projections indicate decreases in the frequency of days and nights that are considered "cold" in the current climate.

Precipitation

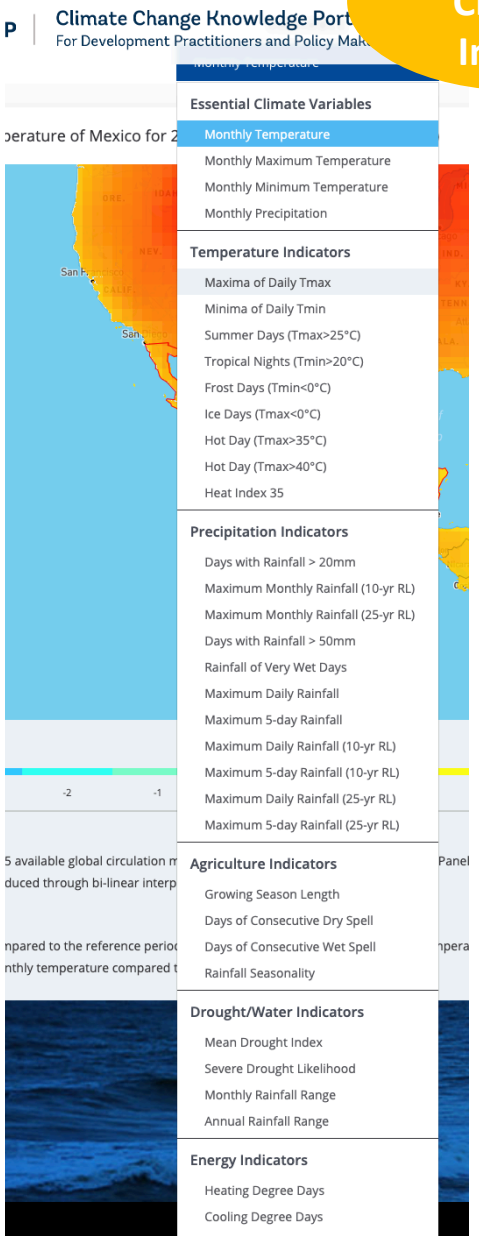
Projected Climate Trends

Aggregated Country Statistics

DATA SNAPSHOTS

- Mean annual temperature will rise by **1.99°C (1.24°C to 2.89°C)** in **2040-2059** (RCP 8.5, Ensemble)
- Annual precipitation will decreases by **-49.57mm (-344.39mm to 226.98mm)** in **2040-2059** (RCP 8.5, Ensemble)
- Annual Cooling Degree Days will rise by **1004.67mm (711.25mm to 667.82mm)** in **2040-2059** (RCP 8.5, Ensemble)
- Annual Maximum 5-day Rainfall (25-yr RL) will rise by **11.87mm (-53.01mm to 137.95mm)** in **2040-2059** (RCP 8.5, Ensemble)

39 Unique Climate Indices

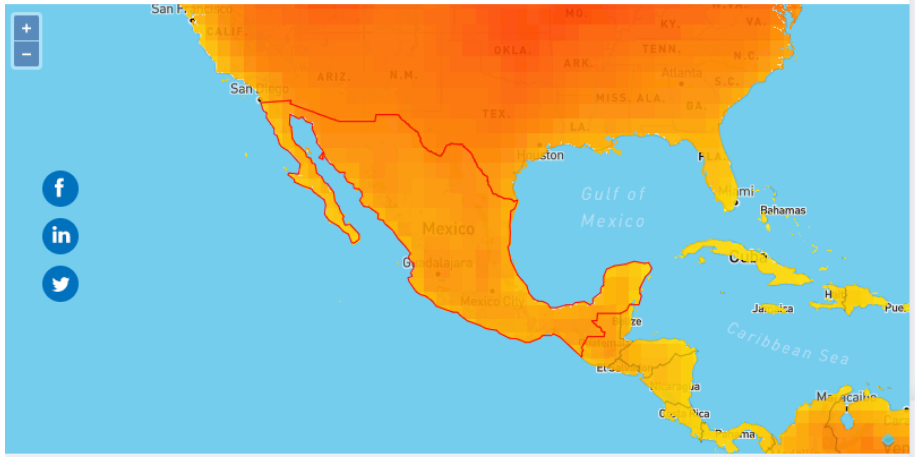


Climate Data: Projections

Define time period, statistic, scenario, model for tailored climate information

VARIABLE	TIME PERIOD	STATISTIC	SCENARIO	MODEL
Monthly Temperature	2080-2099	Change (anomaly)	RCP 8.5 (High emission)	ensemble

Projected Change in Monthly Temperature of Mexico for 2080-2099 (Compared to 1986-2005)



MONTHLY TEMPERATURE (˚C)

-5 -4 -3 -2 -1 0 1 2 3 4 5 6

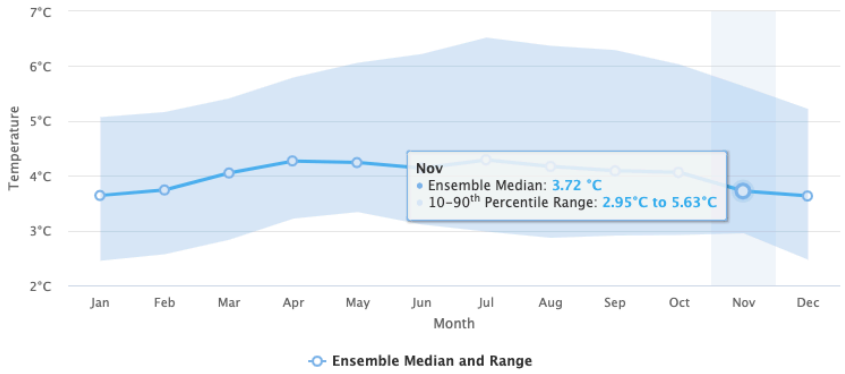
METADATA

Future climate information is derived from 35 available global circulation models (GCMs) used by the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report. Data is presented at a 1°x1° global grid spacing, produced through bi-linear interpolation. + Source (PDF)

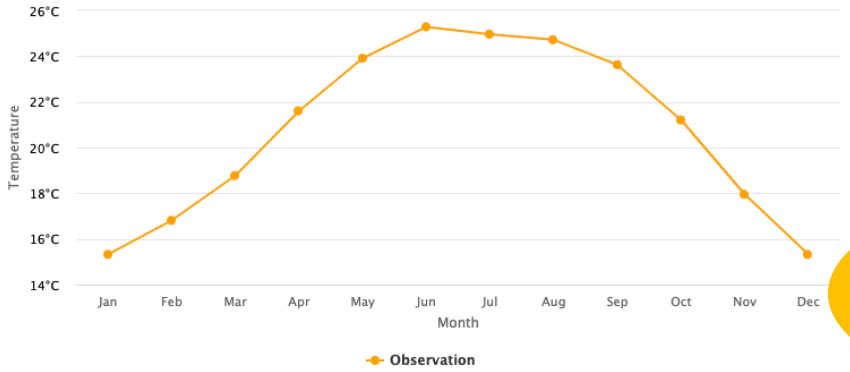
DATA DESCRIPTION

Mean or change in monthly temperature compared to the reference period (1986-2005). In general, value of monthly temperature change varies between 0 and 4 degrees. Zero value indicates there is no change in projected monthly temperature compared to historical mean.

Projected Change in Monthly Temperature for Mexico for 2080-2099



Historical Observed Monthly Temperature for Mexico for 1986-2005

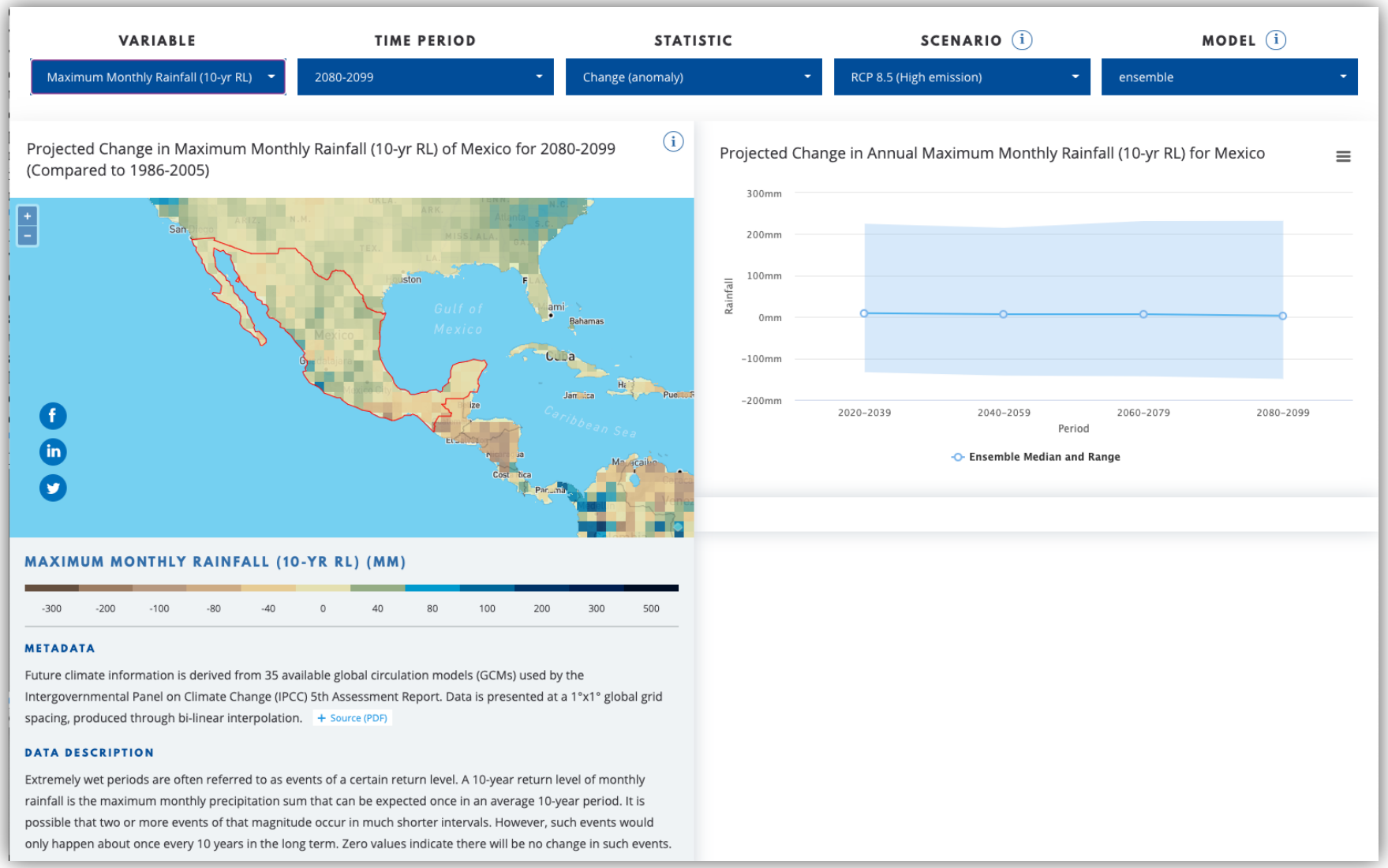


Change in Monthly Temperatures:

- Projections for increasing temperatures expected to occur most significantly and rapidly in northern arid zones, central and coastal regions
- Higher rates of evapotranspiration, impacts to aridity and drought and water supply

Compare Against Historical Trends

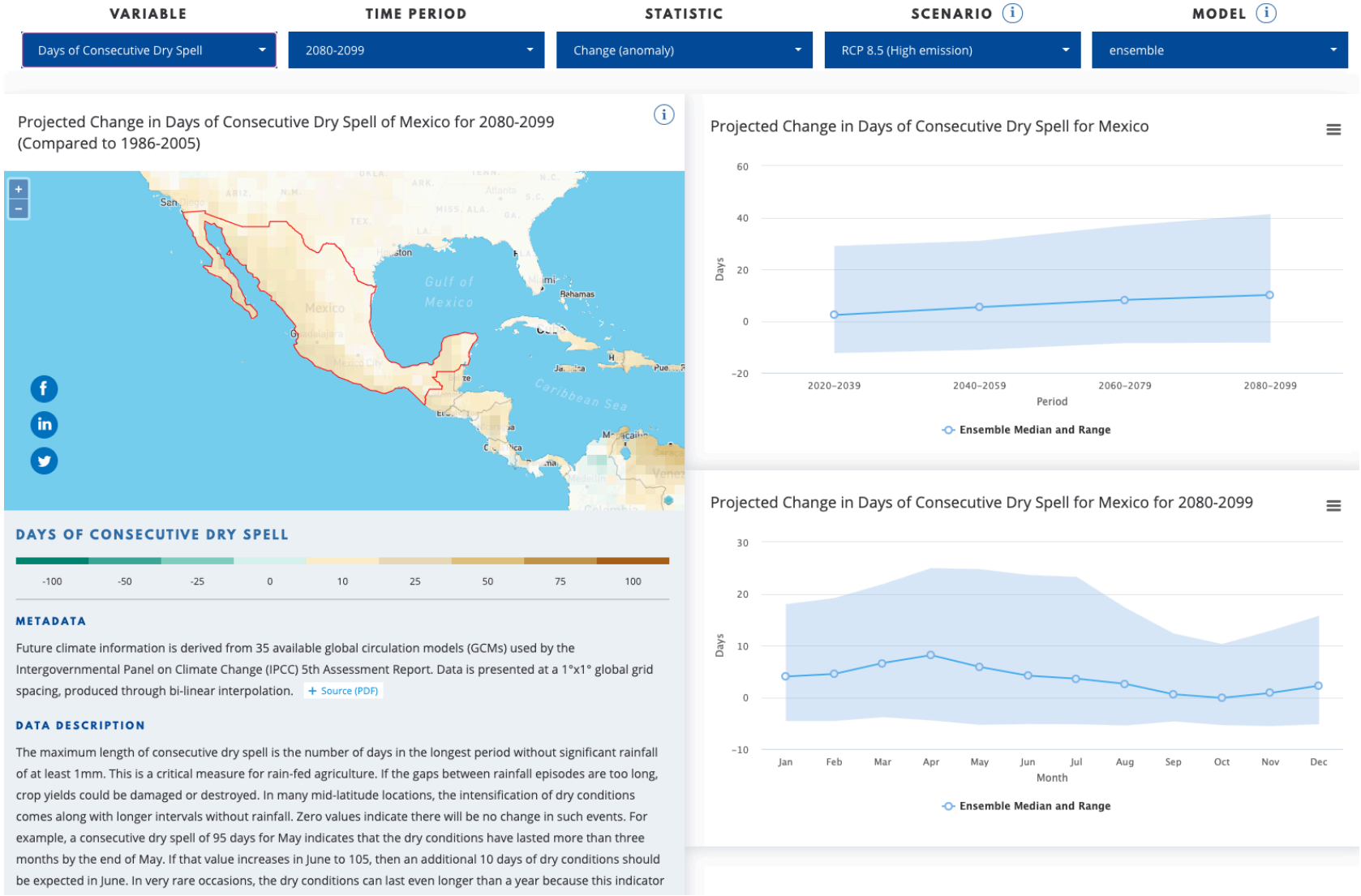
Climate Data: Projections



Change in Maximum Daily Rainfall (10yr RL):

- Implications of changing precipitation patterns will impact the rates of surface water infiltration and the recharge rates for groundwater.
- Low-water storage capacity increases dependence on unreliable rainfall patterns.

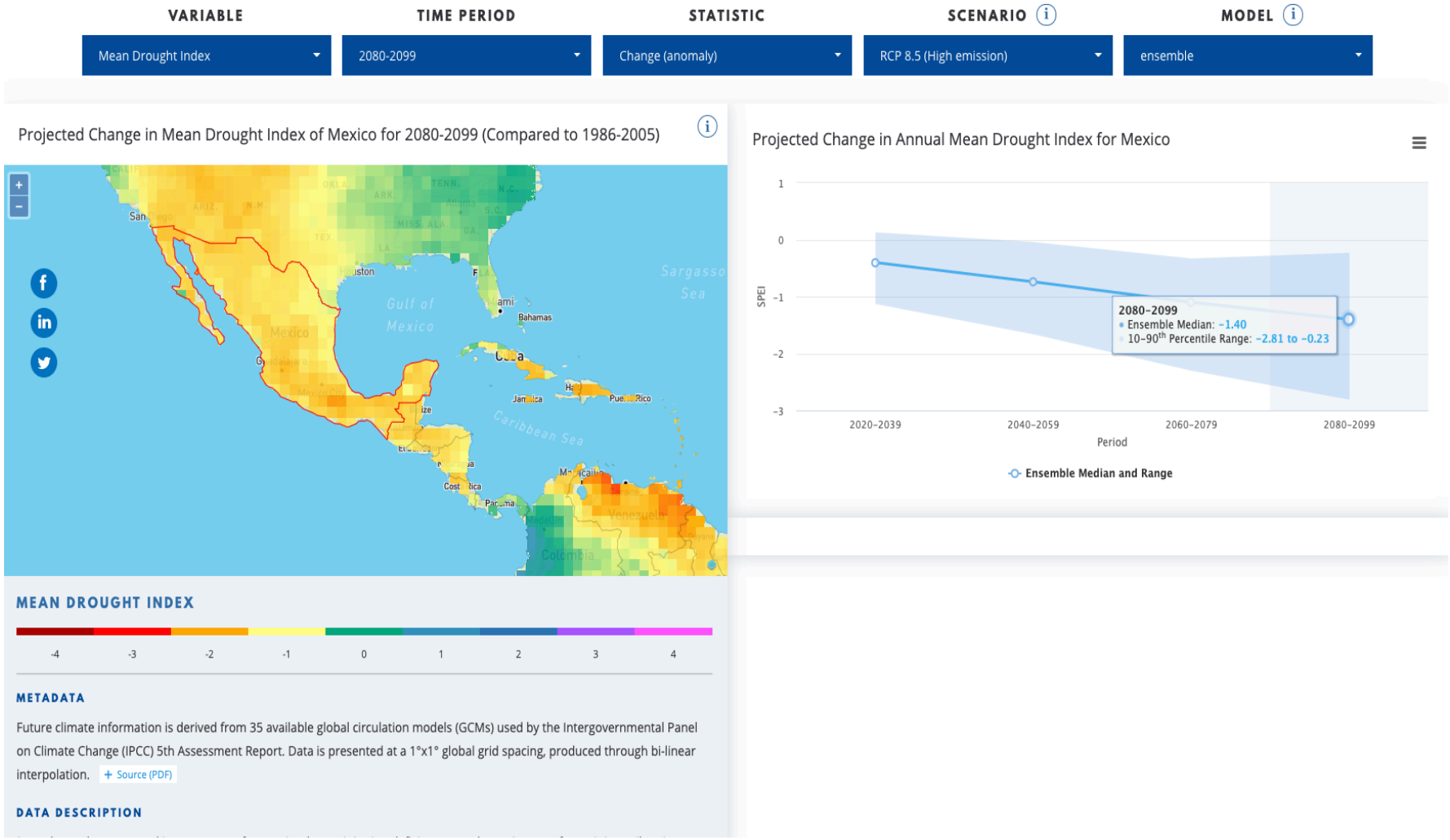
Climate Data: Projections



Change in Consecutive Dry Days:

- Implications for surface water and aquifer recharge
- Water quality and water quantity expected to reduce; impacts to humans, ecosystems, habitats

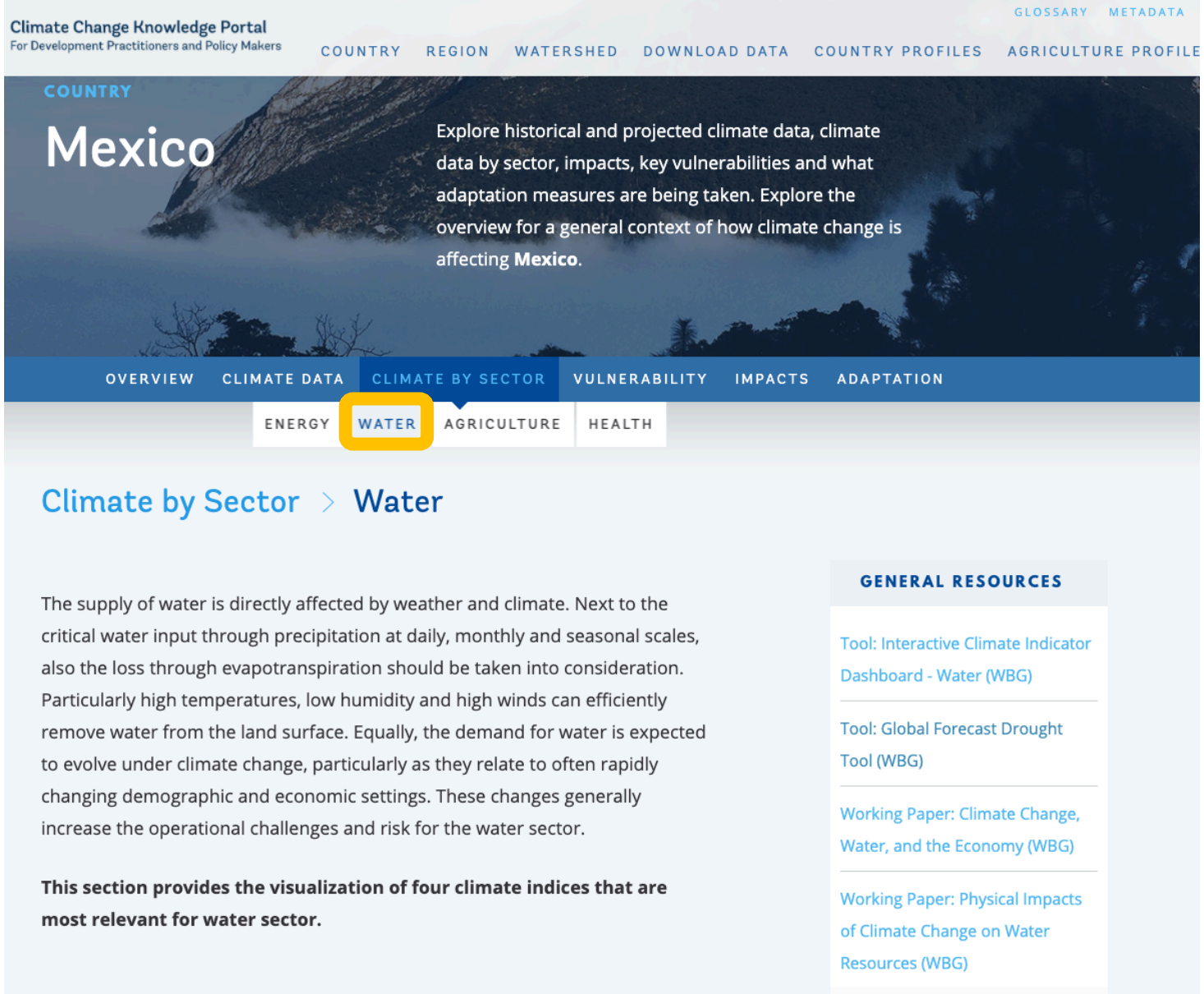
Climate Data: Projections



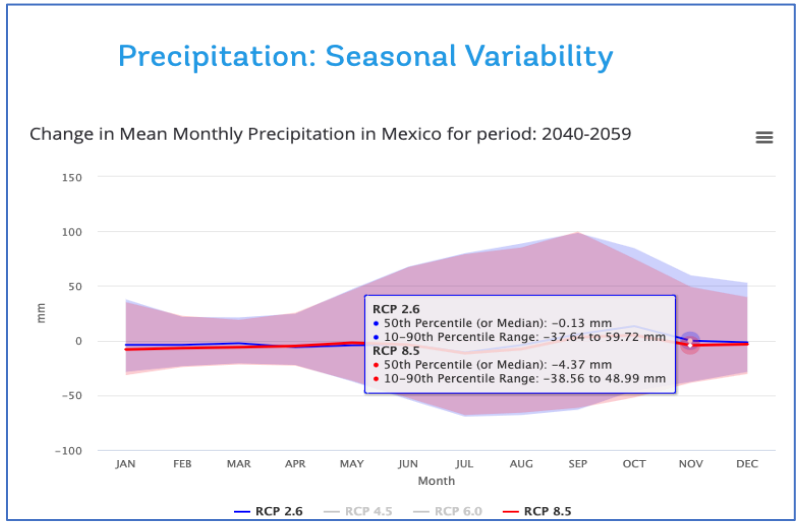
Change in Mean Drought Index:

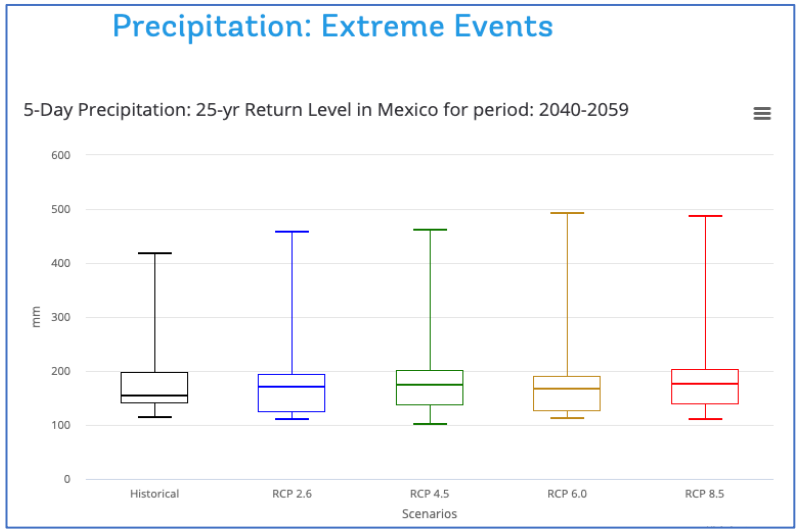
- Increasing aridity for Mexico's central and southern regions and southern coast, exacerbates existing issues around water scarcity and drought periods
- Consecutive dry days are expected to increase, while extreme rainfall events may also increase, which will impact surface water runoff

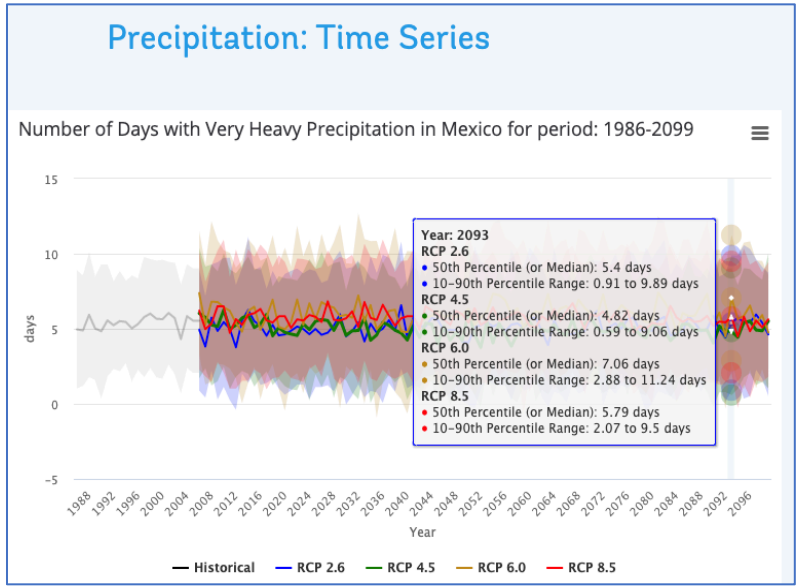
Climate by Sector: Water

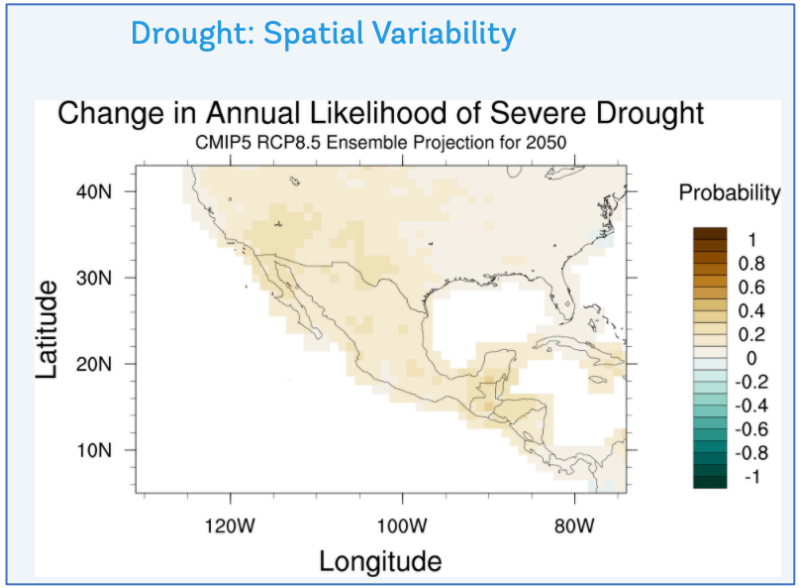


Climate by Sector: Water







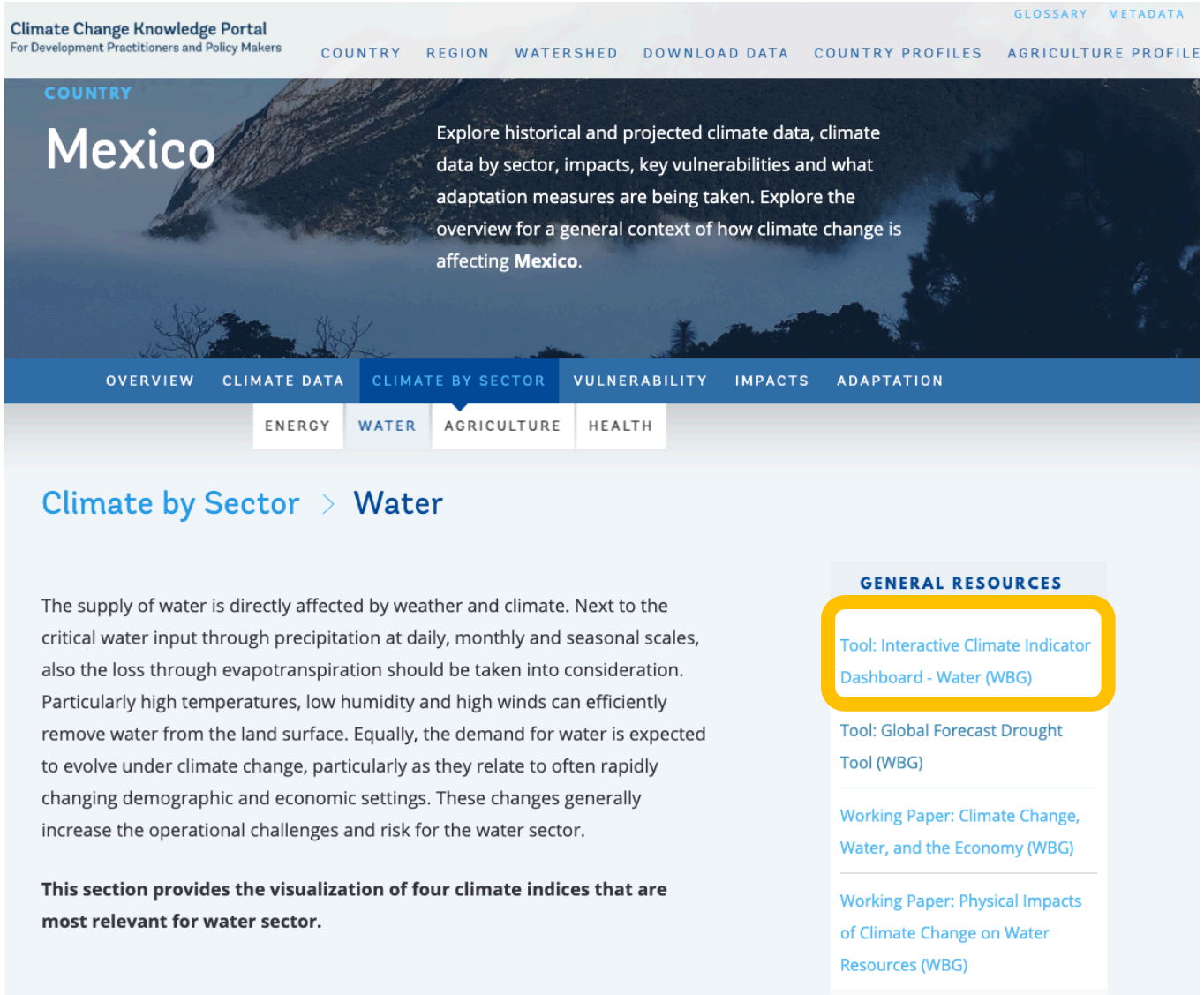


Sector specific indicators present a high-level summary of potential future climate change impacts.

Climate variability and change impose different problems for different sectors. While general trends can be used to outline emerging challenges, the dominant factors affecting ecosystems and people vary strongly on a case-by-case basis.

The selection and visualization of key climate indicators per sector was conducted through a participatory consultation process with sector specialists and development project leaders.

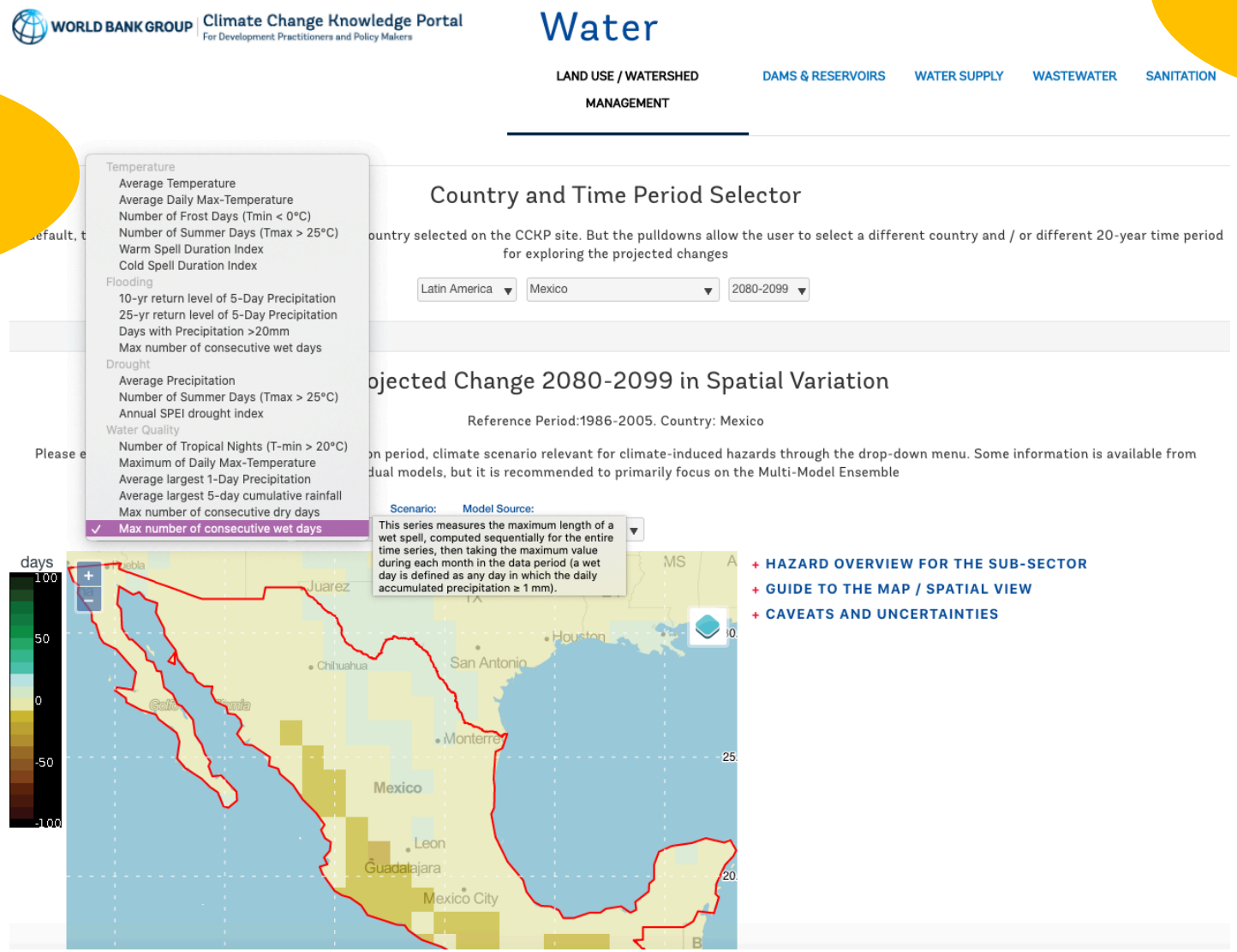
Interactive Sector Dashboards: Water



Interactive Sector Dashboards: Water

Use sub-sector dashboards to gather tailored information

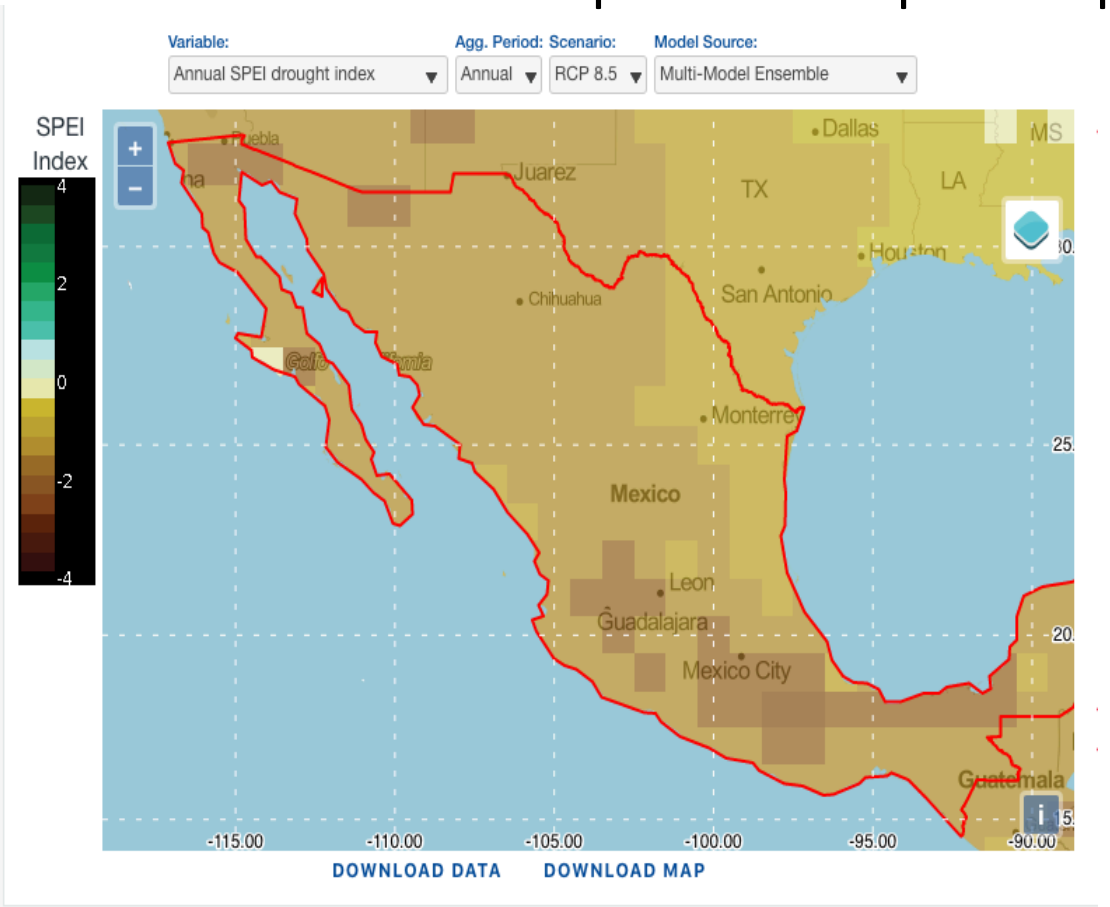
Pre-loaded variables most suited for identifying and understanding sector and sub-sector contexts

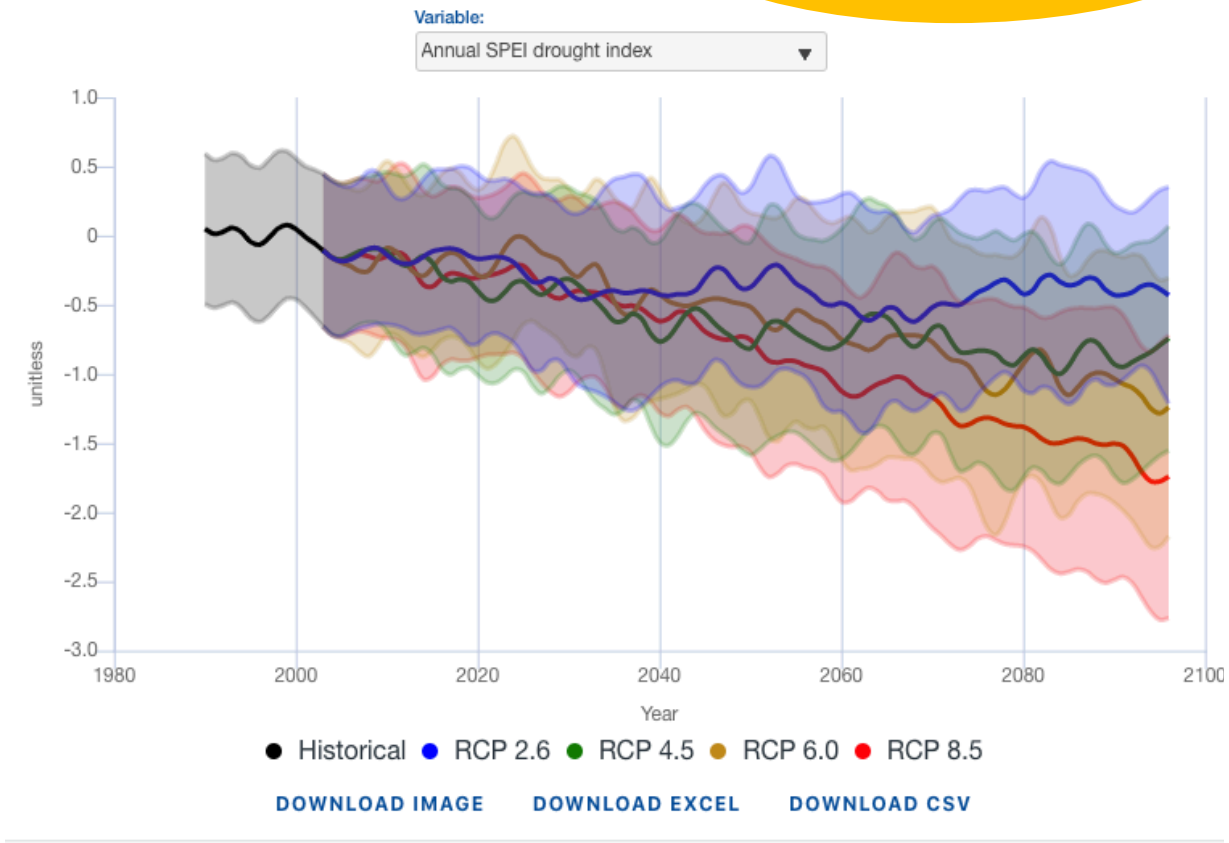


Interactive Sector Dashboards: Water

Example:
Standardized Precipitation Evapotranspiration Index (SPEI)

Compare spatial variation to nationally aggregated projection trends

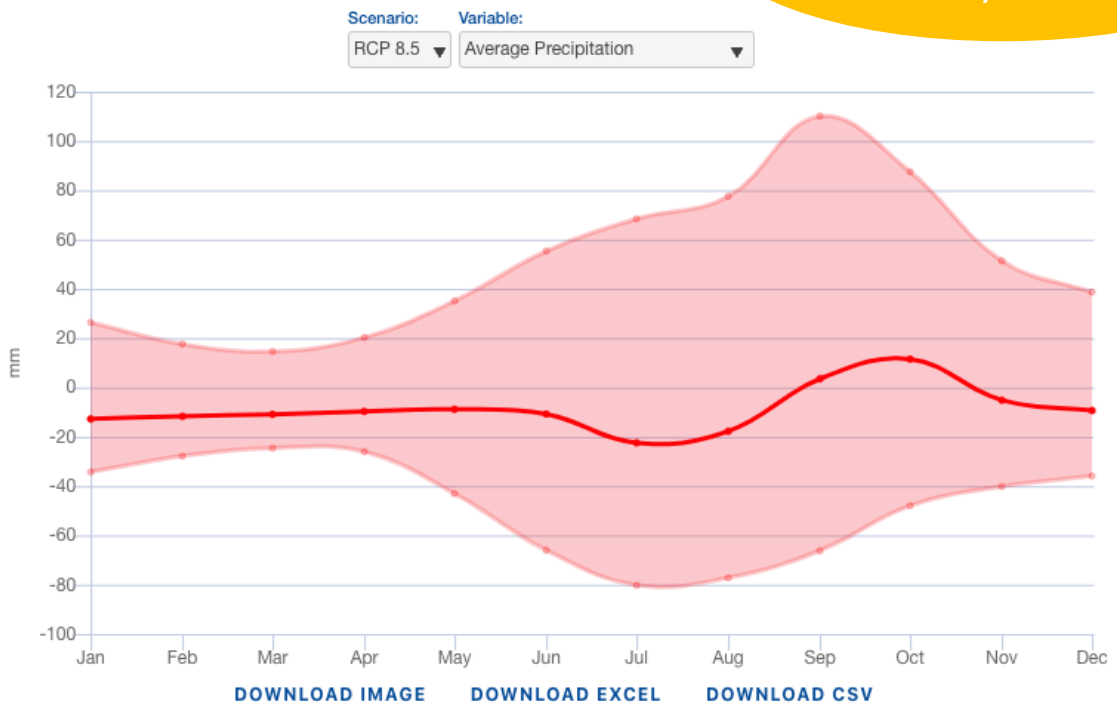




Interactive Sector Dashboards: Water

Example:
Average Precipitation

Compare change across the seasonal cycle



STAP's Question 2

How will the project be affected by climate risks over the period 2020 to 2050, and have the impacts been addressed adequately?

have drivers of the climate vulnerabilities been analyzed for the project and planned interventions?

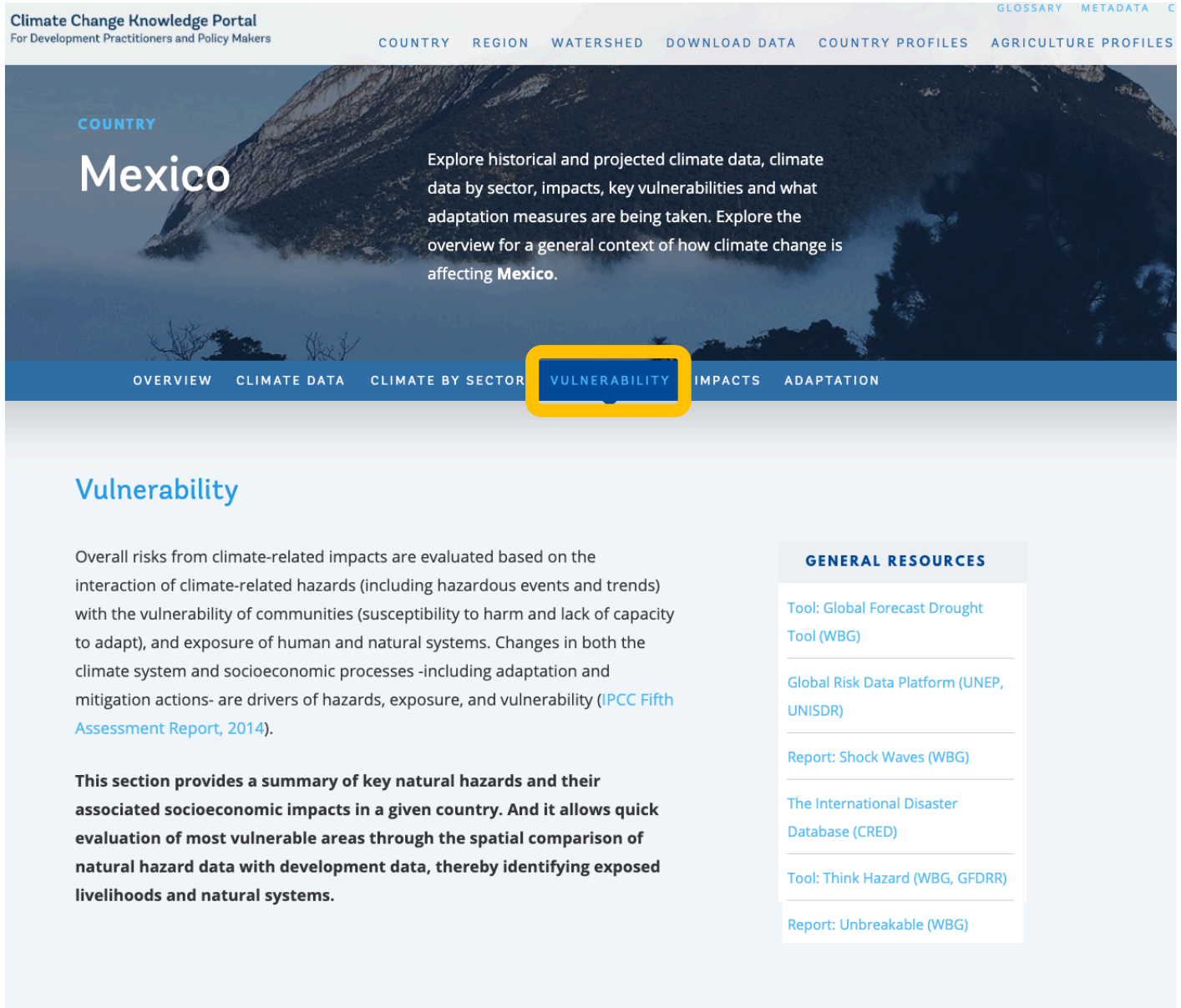
Information that would be useful includes:

- Expected climate impacts and level of severity on targeted components at project location.
- Impacts on the efficacy of proposed interventions.
- Will proposed intervention reduce or decrease climate vulnerability?
- Potential for maladaptation.

https://theconversation.com/global-drought-has-not-increased-but-climate-change-is-still-a-threat-10751

https://www.worldpoliticsreview.com/insights/28056/the-crippling-african-drought-shows-the-importance-of-climate-change-adaptation

Vulnerability: Natural Hazards



Vulnerability: Natural Hazards

Overview

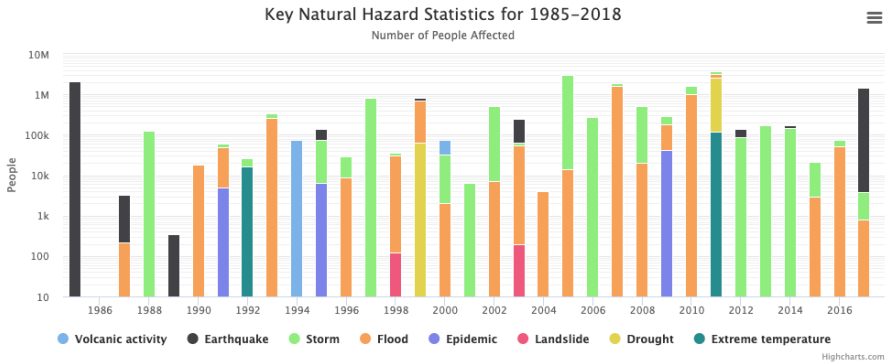
- Over 40% of the country's territory and nearly one-third of the population is exposed to hurricanes, storms, floods, earthquakes, and volcanic eruptions.
- Mexico's coastlines are vulnerable to tropical cyclones and hurricanes from both the Atlantic and Pacific Oceans.

Climate Change Impacts

- Extreme rainfall events may result in soil erosion, mudslides and watershed degradation
- higher temperatures and drought threatens to reduce water storage capacity
- Urbanization and increasing population pressures exacerbated competing demands of natural environment, consumption needs and other water uses such as crop irrigation

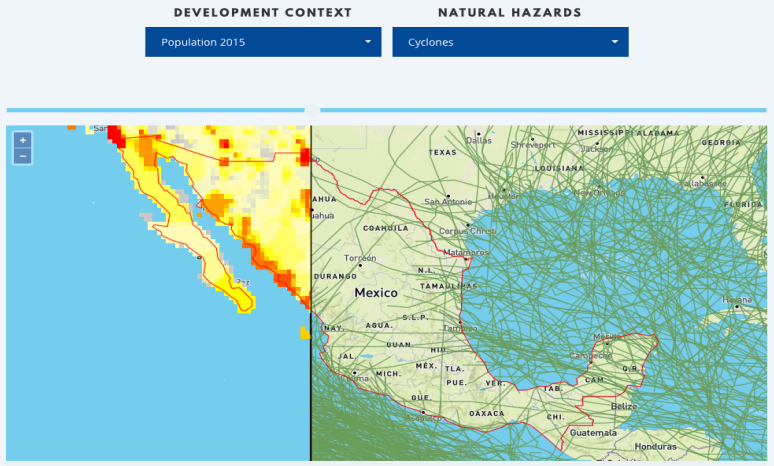
Natural Hazard Statistics

The charts provide overview of the most frequent natural disaster in a given country and understand the impacts of those disasters on human populations.

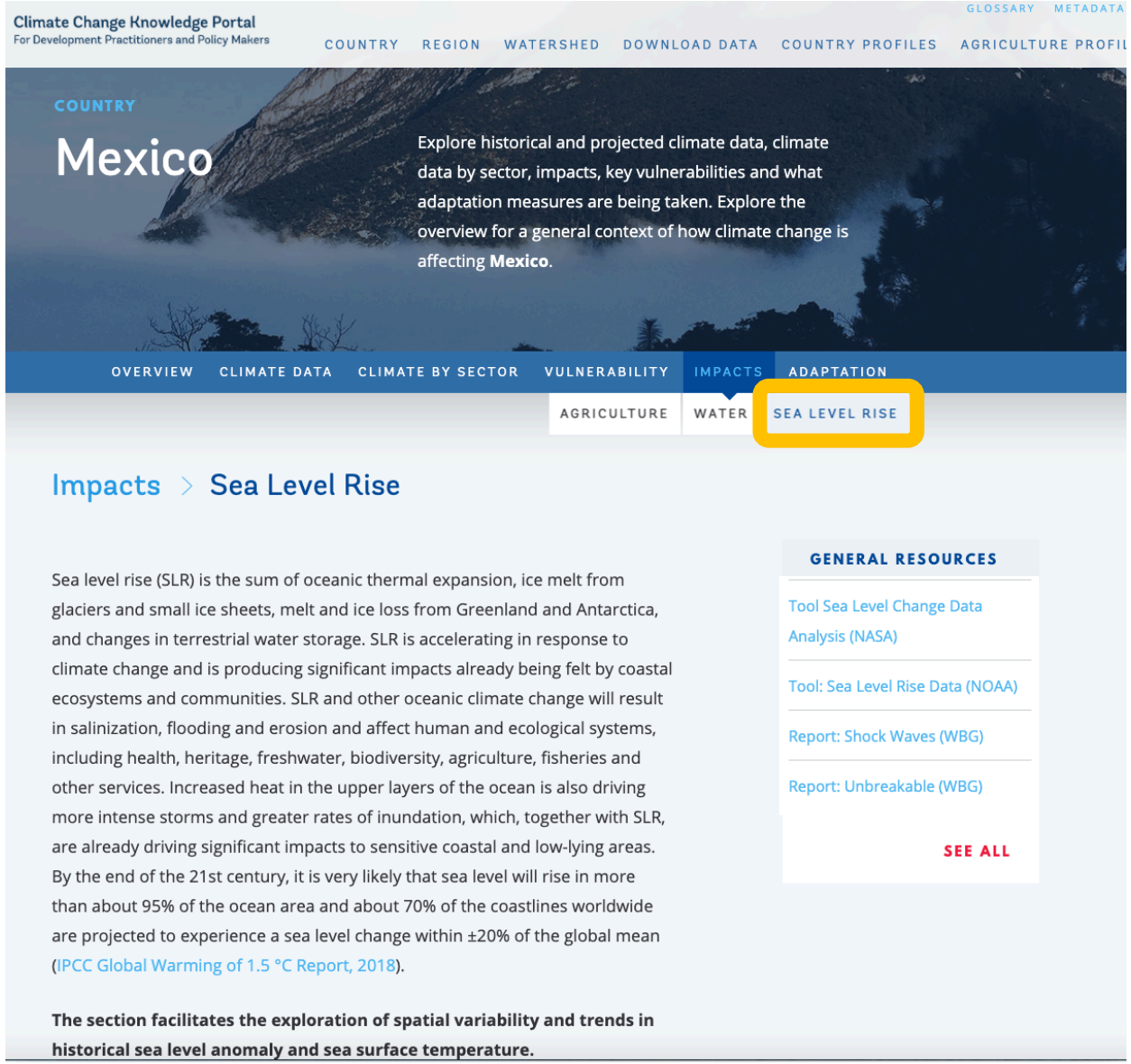


Natural Hazard / Development Nexus

This tool allows the overlay of different natural hazard maps with social economic datasets by sliding the bar horizontally, which provides a broad sense of vulnerable areas.



Impacts: Mexico’s Coastal Zones



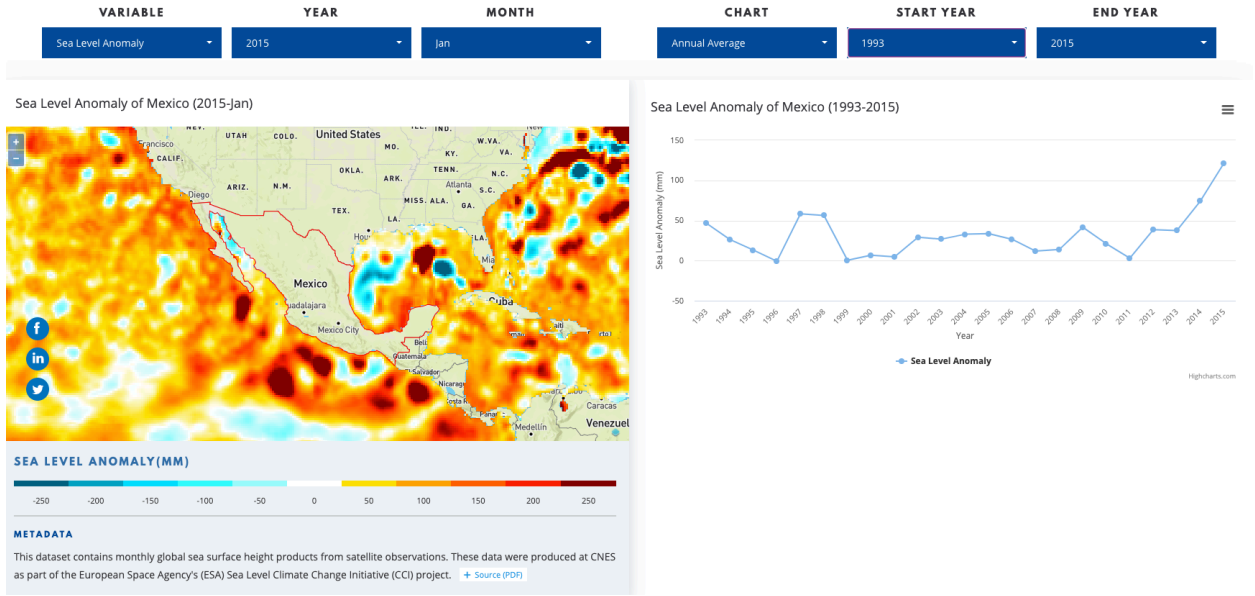
Impacts: Mexico’s Coastal Zones

Overview

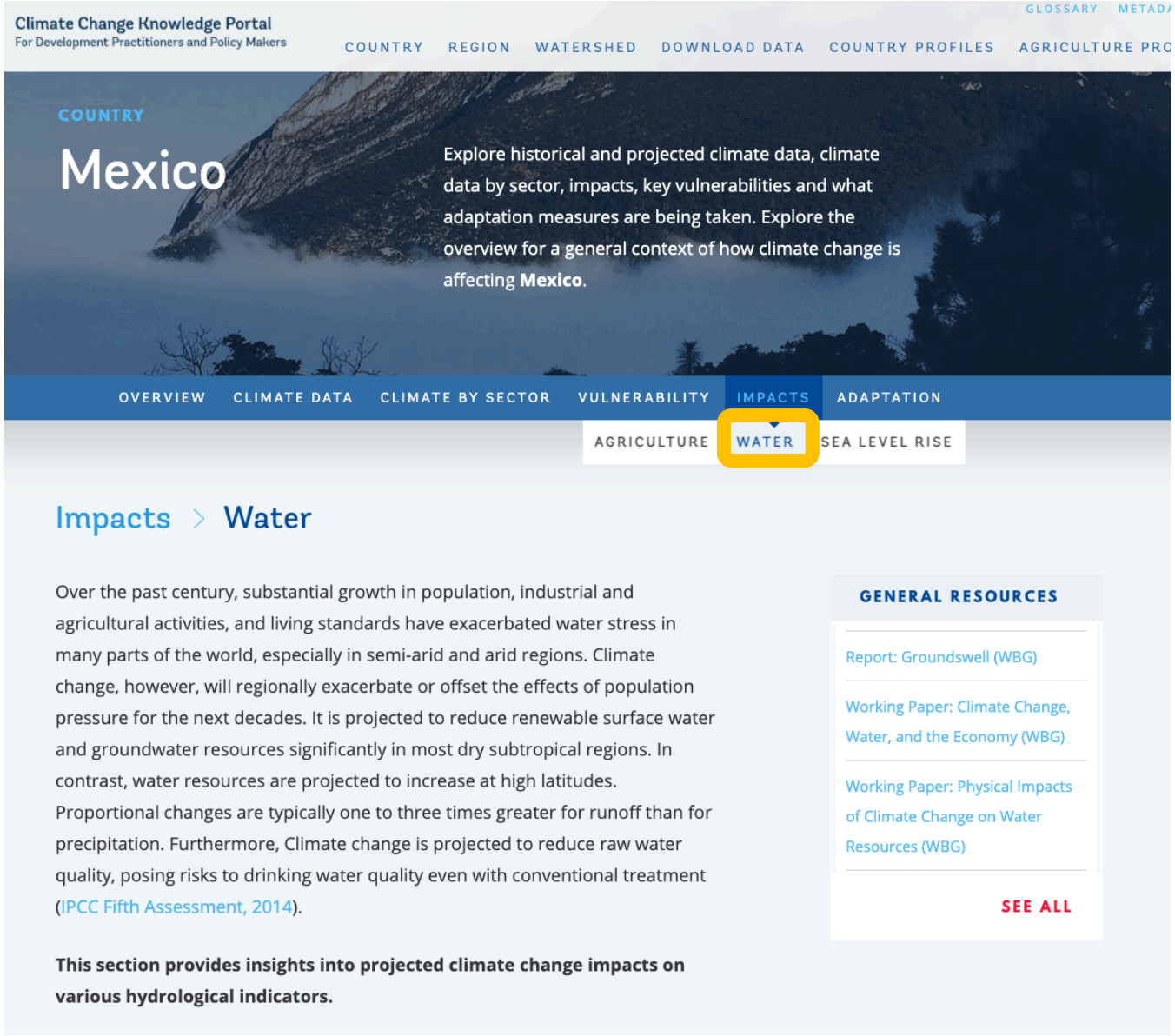
- Coastal zone is vulnerable to a range of climate stressors, including rising sea surface temperatures, ocean acidification, changes in ocean circulation and changes in patterns of extreme weather, including hurricanes.

Climate Change Impacts

- Fishing and port activities are also disrupted by coastal storms that bring heavy rainfall, storm surge and strong winds.
- The states of Veracruz, Tabasco, Campeche and Quintana Roo in the south are major tourist destinations but also are some of the most vulnerable states to severe weather
- An increase in the frequency and intensity of extreme storms will damage coastal infrastructure and ecosystem services and erode beaches.
- Sea level rise will increase salinity, damaging coastal aquifers, agricultural land, wetlands, and ecosystems



Impacts: Mexico's Water Sector



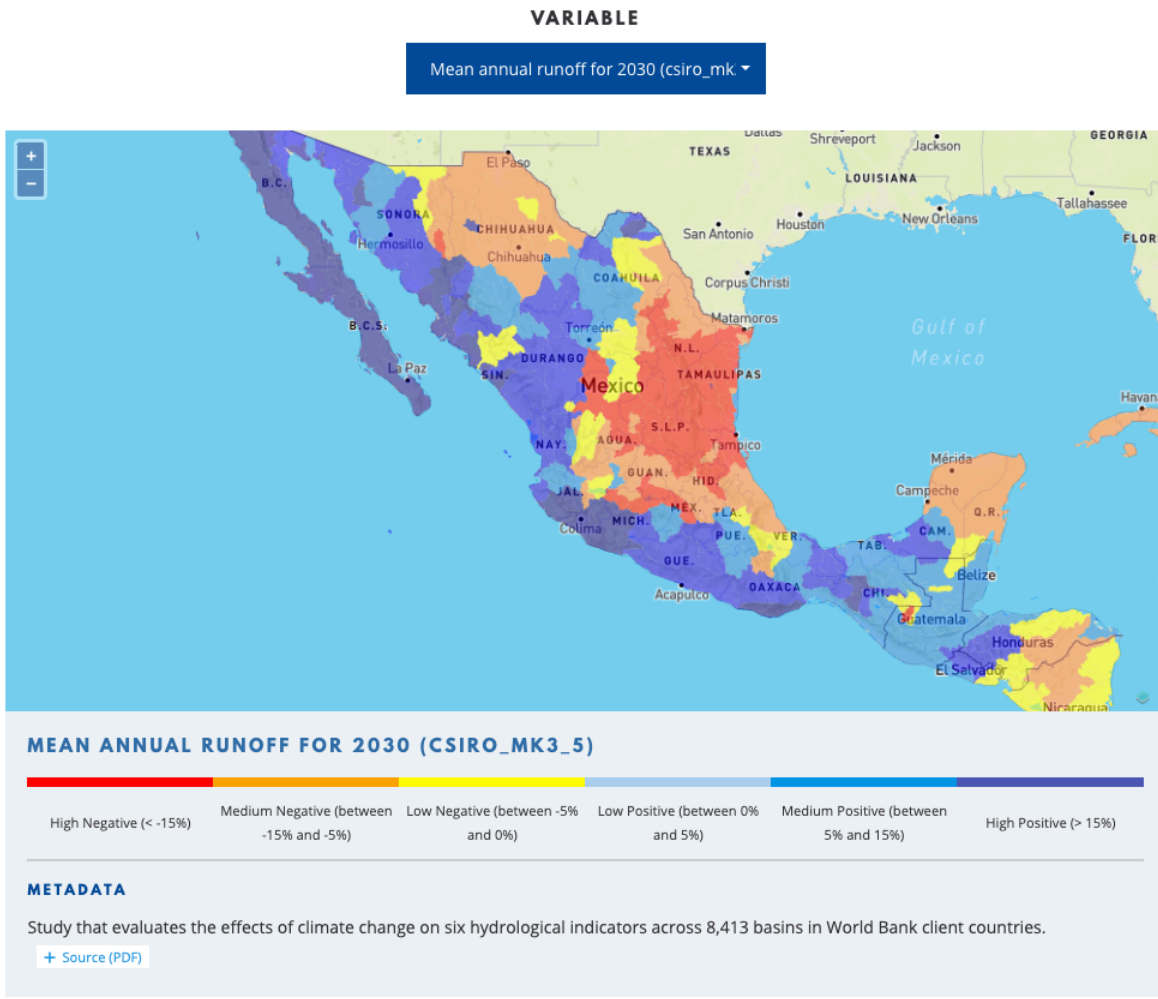
Impacts: Mexico's Water Sector

Overview

- Rainfall decline will affect runoff in rivers, water stored in dams and aquifer recharge. Saltwater intrusion into coastal aquifers from rising seas will further deplete freshwater supplies.

Climate Change Impacts

- Projections suggest reductions in surface water and groundwater supplies as well as decreased groundwater recharge from reduced precipitation.
- Increased periods of drought and the reduction in rainfall will reduce the country's hydro-power potential and may lead to disruption in energy supplies; especially in the increasing heat of the summer periods at times of peak demand.



Impacts: Mexico’s Water Sector

Overview

- The majority of inland Mexico is projected to experience reduced rainfall, including an increase in consecutive dry days, particularly in the country’s northern areas; likely lead to reductions in surface waters and the supply of freshwater.

Climate Change Impacts

- By the 2050s, Mexico City is projected to experience a reduction of between 10% to 17% in its per capita water supply.
- Increased periods of drought and the reduction in rainfall will reduce the country’s hydro-power potential and may lead to disruption in energy supplies; especially in the increasing heat of the summer periods at times of peak demand.

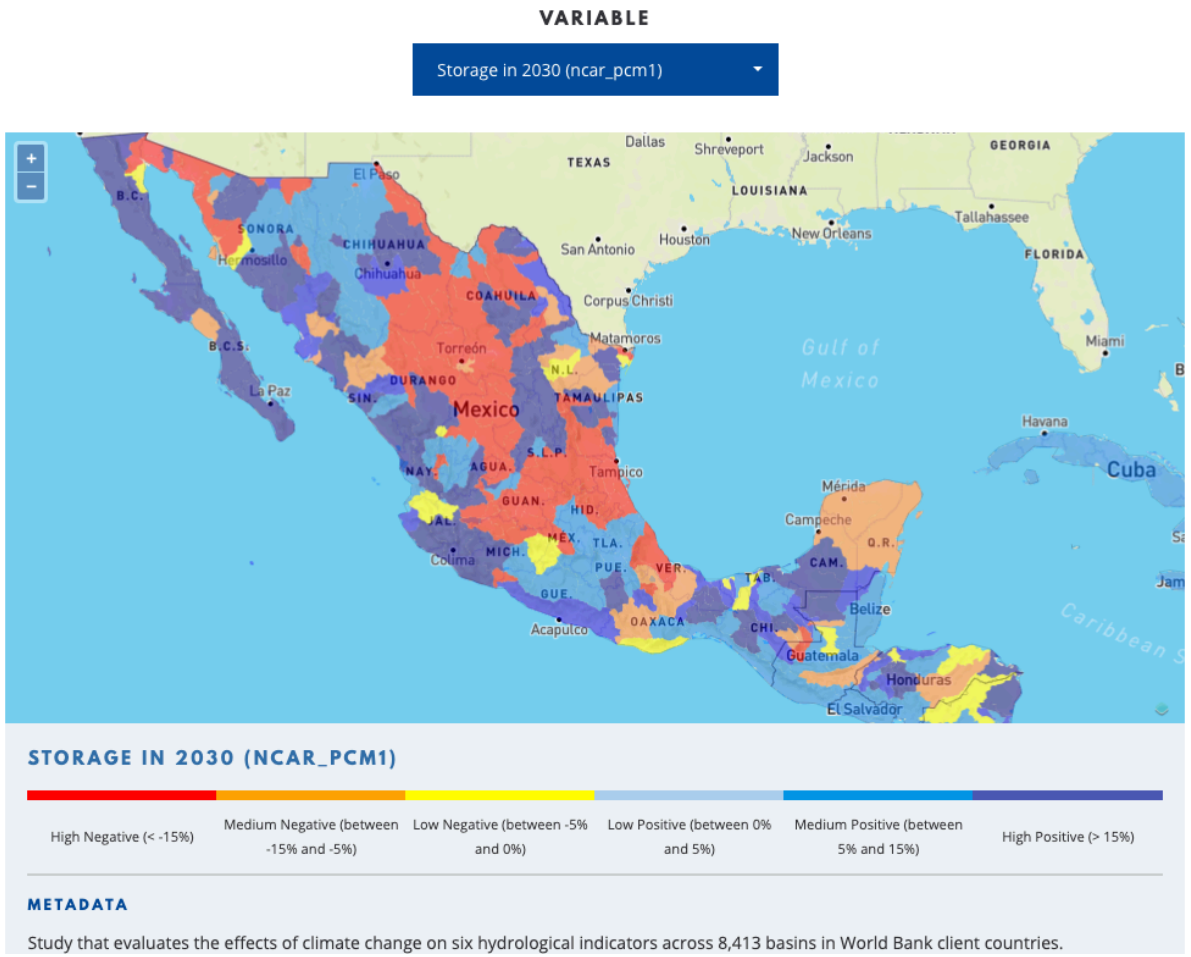
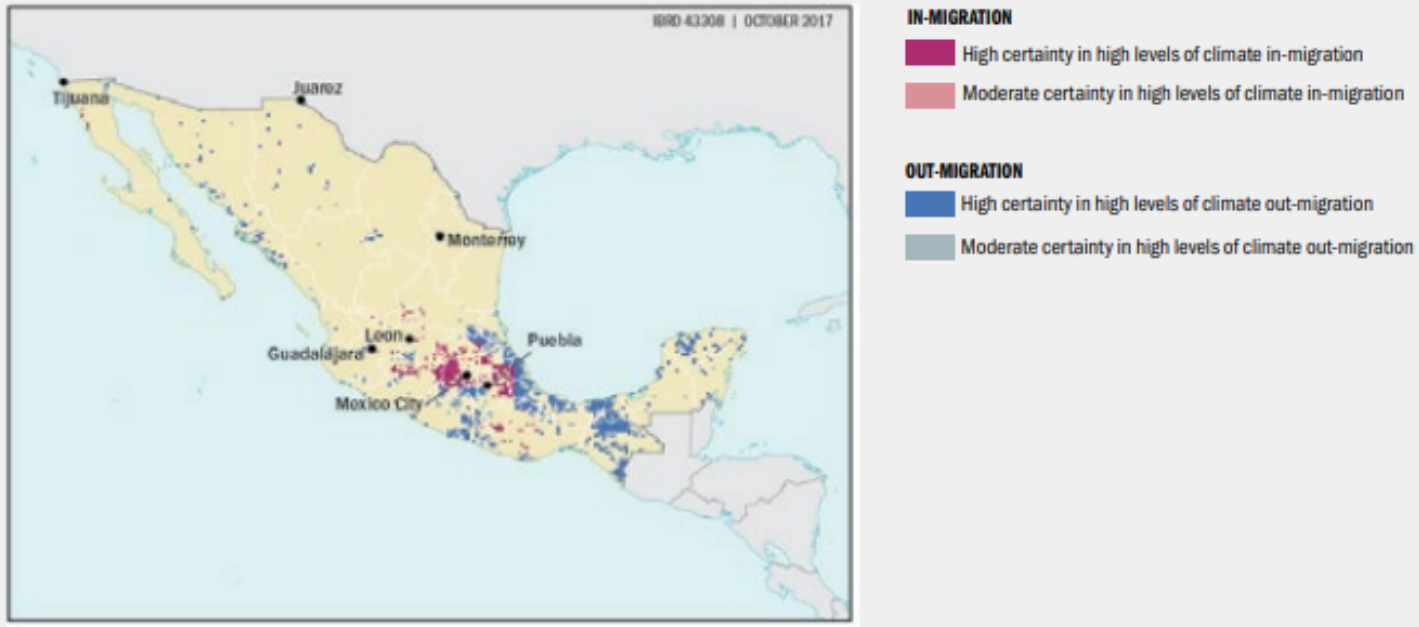


Figure 5.24: Hotspots projected to have high levels of climate in-migration and climate out-migration in Mexico, 2030 and 2050



Note: High certainty reflects agreement across all three scenarios modeled, and moderate certainty reflects agreement across two scenarios. In- and out-migration hotspots are thus areas in which at least two scenarios concur on density changes in the top 10th percentile of the density distribution, which in Mexico and Central America represents an increased population density in 2050 of about 3.3 to 6.8 people per square kilometer, depending on the scena For decreased population density, it is about minus 1.8 to minus 3 people per square kilometer.

Impact on Livelihoods and internal Migration – Groundswell Report

CCKP Climate Risk County Profile - MEXICO

Historical Data

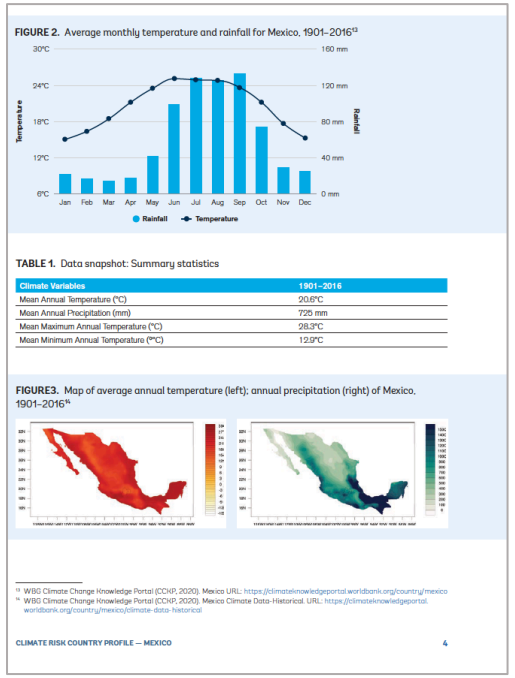


FIGURE 2. Average monthly temperature and rainfall for Mexico, 1901–2016[13]

TABLE 1. Data snapshot: Summary statistics

Climate Variables	1901–2016
Mean Annual Temperature (°C)	20.6°C
Mean Annual Precipitation (mm)	725 mm
Mean Maximum Annual Temperature (°C)	28.3°C
Mean Minimum Annual Temperature (°C)	12.9°C

FIGURE3. Map of average annual temperature (left); annual precipitation (right) of Mexico, 1901–2016[14]

[13] WBG Climate Change Knowledge Portal (CCKP, 2020). Mexico URL: https://climateknowledgeportal.worldbank.org/country/mexico
[14] WBG Climate Change Knowledge Portal (CCKP, 2020). Mexico Climate Data-Historical. URL: https://climateknowledgeportal.worldbank.org/country/mexico/climate-data-historical

CLIMATE RISK COUNTRY PROFILE — MEXICO 4

Future Projections

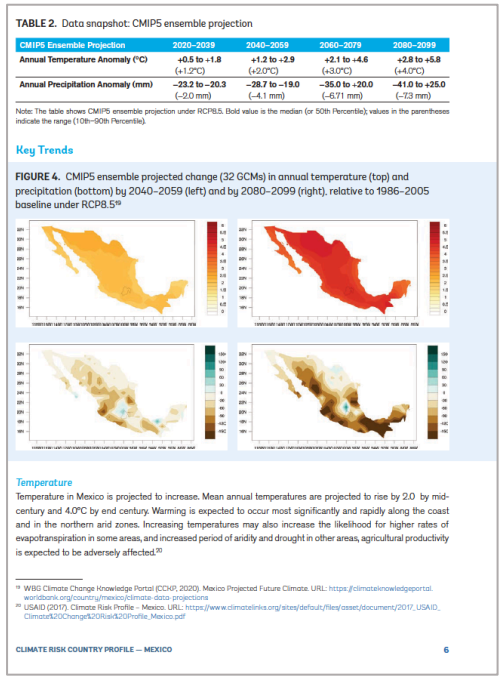


TABLE 2. Data snapshot: CMIP5 ensemble projection

CMIP5 Ensemble Projection	2020–2039	2040–2059	2060–2079	2080–2099
Annual Temperature Anomaly (°C)	+0.5 to +1.8 (+1.2°C)	+1.2 to +2.9 (+2.0°C)	+2.1 to +4.6 (+3.0°C)	+2.8 to +5.8 (+4.0°C)
Annual Precipitation Anomaly (mm)	−23.2 to −20.3 (−2.0 mm)	−28.7 to −19.0 (−4.1 mm)	−35.0 to −20.0 (−6.71 mm)	−41.0 to +25.0 (−7.13 mm)

Note: The table shows CMIP5 ensemble projection under RCP8.5. Bold value is the median (or 50th Percentile); values in the parentheses indicate the range (10th–90th Percentile).

Key Trends

FIGURE 4. CMIP5 ensemble projected change (32 GCMs) in annual temperature (top) and precipitation (bottom) by 2040–2059 (left) and by 2080–2099 (right), relative to 1986–2005 baseline under RCP8.5[19]

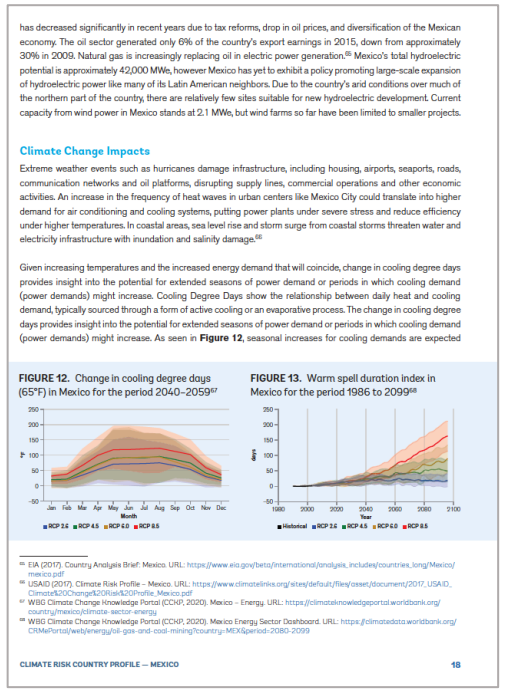
Temperature

Temperature in Mexico is projected to increase. Mean annual temperatures are projected to rise by 2.0 by mid-century and 4.0°C by end century. Warming is expected to occur most significantly and rapidly along the coast and in the northern arid zones. Increasing temperatures may also increase the likelihood for higher rates of evapotranspiration in some areas, and increased period of aridity and drought in other areas, agricultural productivity is expected to be adversely affected.[20]

[19] WBG Climate Change Knowledge Portal (CCKP, 2020). Mexico Projected Future Climate. URL: https://climateknowledgeportal.worldbank.org/country/mexico/climate-data-projections
[20] USAID (2017). Climate Risk Profile – Mexico. URL: https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile_Mexico.pdf

CLIMATE RISK COUNTRY PROFILE — MEXICO 6

Key Sector Analysis



has decreased significantly in recent years due to tax reforms, drop in oil prices, and diversification of the Mexican economy. The oil sector generated only 6% of the country's export earnings in 2015, down from approximately 30% in 2009. Natural gas is increasingly replacing oil in electric power generation.[65] Mexico's total hydroelectric potential is approximately 42,000 MWe, however Mexico has yet to exhibit a policy promoting large-scale expansion of hydroelectric power like many of its Latin American neighbors. Due to the country's arid conditions over much of the northern part of the country, there are relatively few sites suitable for new hydroelectric development. Current capacity from wind power in Mexico stands at 2.1 MWe, but wind farms so far have been limited to smaller projects.

Climate Change Impacts

Extreme weather events such as hurricanes damage infrastructure, including housing, airports, seaports, roads, communication networks and oil platforms, disrupting supply lines, commercial operations and other economic activities. An increase in the frequency of heat waves in urban centers like Mexico City could translate into higher demand for air conditioning and cooling systems, putting power plants under severe stress and reduce efficiency under higher temperatures. In coastal areas, sea level rise and storm surge from coastal storms threaten water and electricity infrastructure with inundation and salinity damage.[66]

Given increasing temperatures and the increased energy demand that will coincide, change in cooling degree days provides insight into the potential for extended seasons of power demand or periods in which cooling demand (power demands) might increase. Cooling Degree Days show the relationship between daily heat and cooling demand, typically sourced through a form of active cooling or an evaporative process. The change in cooling degree days provides insight into the potential for extended seasons of power demand or periods in which cooling demand (power demands) might increase. As seen in **Figure 12**, seasonal increases for cooling demands are expected

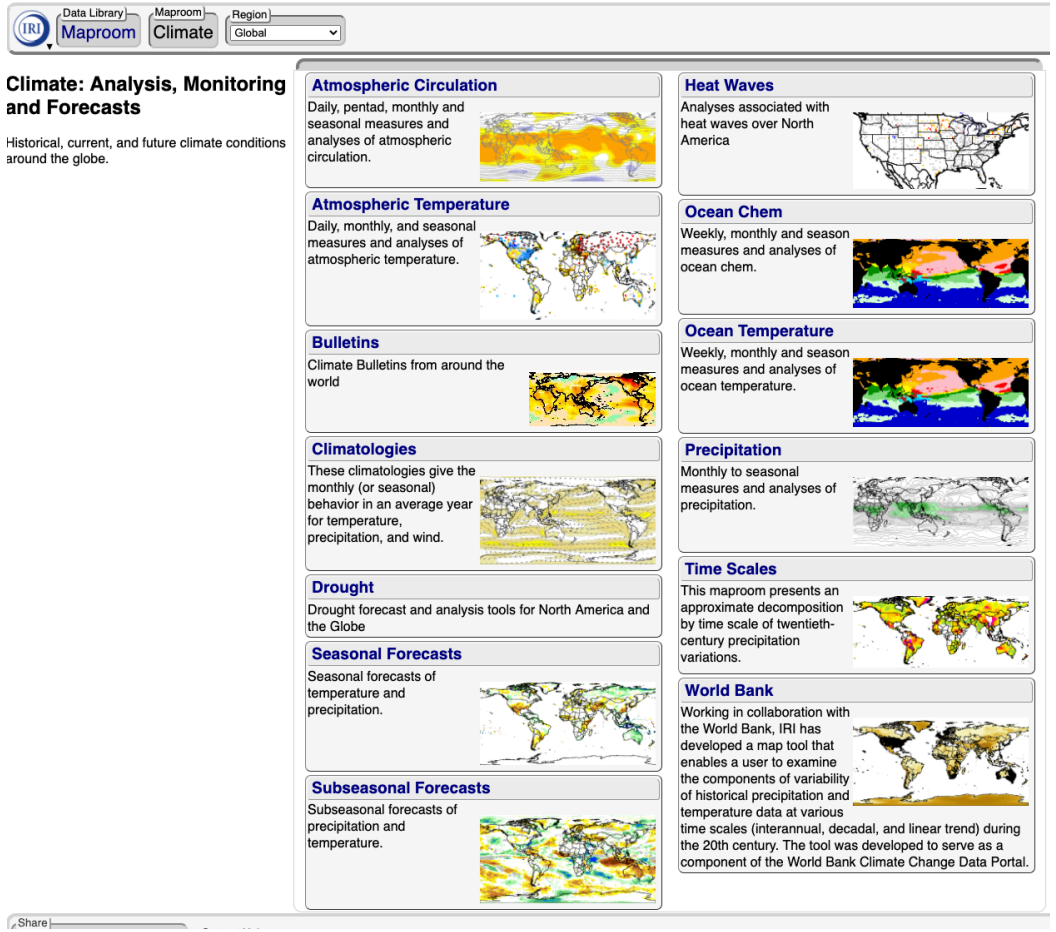
FIGURE 12. Change in cooling degree days (65°F) in Mexico for the period 2040–2059[67]

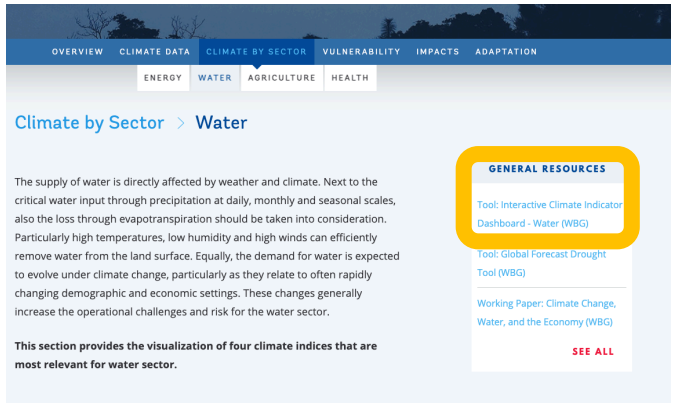
FIGURE 13. Warm spell duration index in Mexico for the period 1986 to 2099[68]

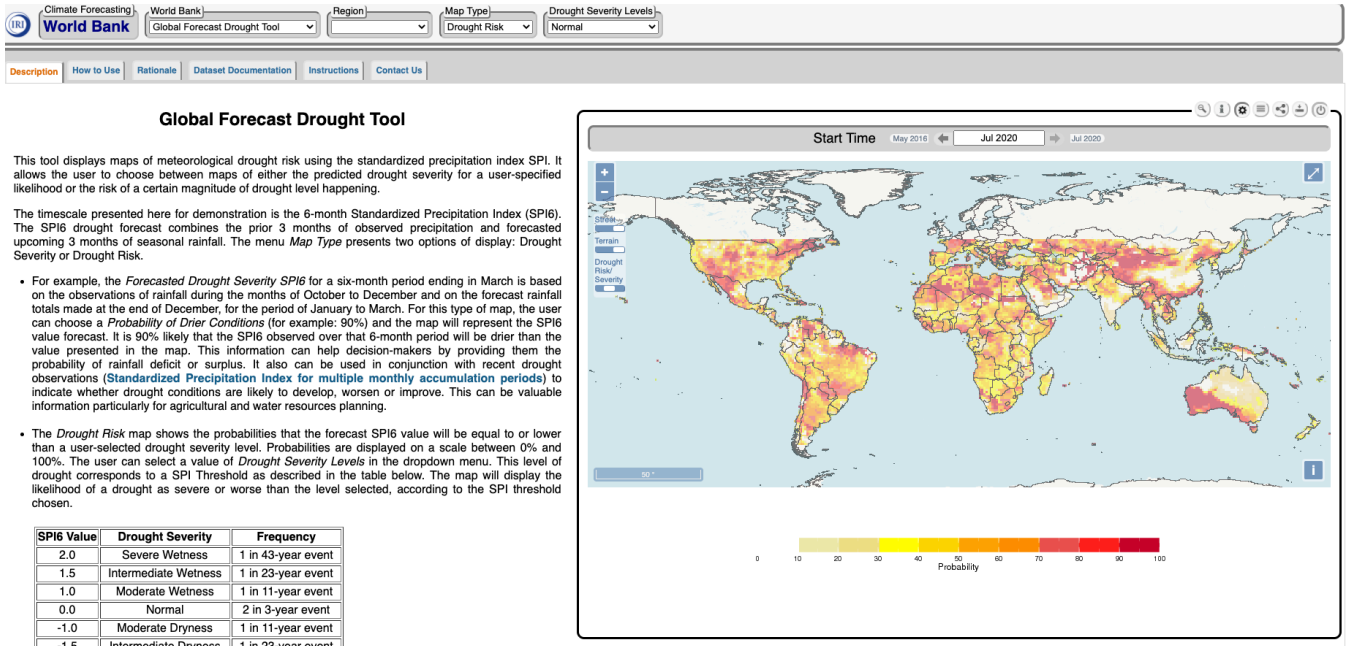
[65] EIA (2017). Country Analysis Brief: Mexico. URL: https://www.eia.gov/beta/international/analysis_includes/countries_long/Mexico/mexico.pdf
[66] USAID (2017). Climate Risk Profile – Mexico. URL: https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile_Mexico.pdf
[67] WBG Climate Change Knowledge Portal (CCKP, 2020). Mexico – Energy. URL: https://climateknowledgeportal.worldbank.org/country/mexico/climate-sector-energy
[68] WBG Climate Change Knowledge Portal (CCKP, 2020). Mexico Energy Sector Dashboard. URL: https://climatedata.worldbank.org/CRMePortal/web/energy/oil-gas-and-coal-mining?country=MEX&period=2080-2099

CLIMATE RISK COUNTRY PROFILE — MEXICO 18

Additional Tools and Resources







Global Forecast Drought Tool

This tool displays maps of meteorological drought risk using the standardized precipitation index SPI. It allows the user to choose between maps of either the predicted drought severity for a user-specified likelihood or the risk of a certain magnitude of drought level happening.

The timescale presented here for demonstration is the 6-month Standardized Precipitation Index (SPI6). The SPI6 drought forecast combines the prior 3 months of observed precipitation and forecasted upcoming 3 months of seasonal rainfall. The menu *Map Type* presents two options of display: Drought Severity or Drought Risk.

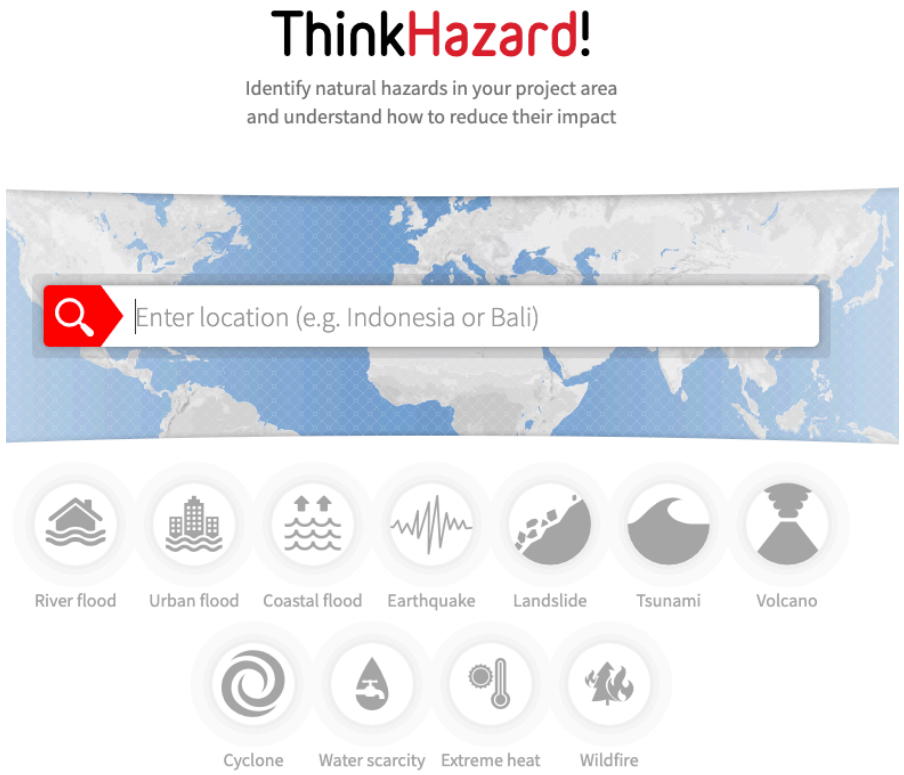
- For example, the *Forecasted Drought Severity SPI6* for a six-month period ending in March is based on the observations of rainfall during the months of October to December and on the forecast rainfall totals made at the end of December, for the period of January to March. For this type of map, the user can choose a *Probability of Drier Conditions* (for example: 90%) and the map will represent the SPI6 value forecast. It is 90% likely that the SPI6 observed over that 6-month period will be drier than the value presented in the map. This information can help decision-makers by providing them the probability of rainfall deficit or surplus. It also can be used in conjunction with recent drought observations (**Standardized Precipitation Index for multiple monthly accumulation periods**) to indicate whether drought conditions are likely to develop, worsen or improve. This can be valuable information particularly for agricultural and water resources planning.

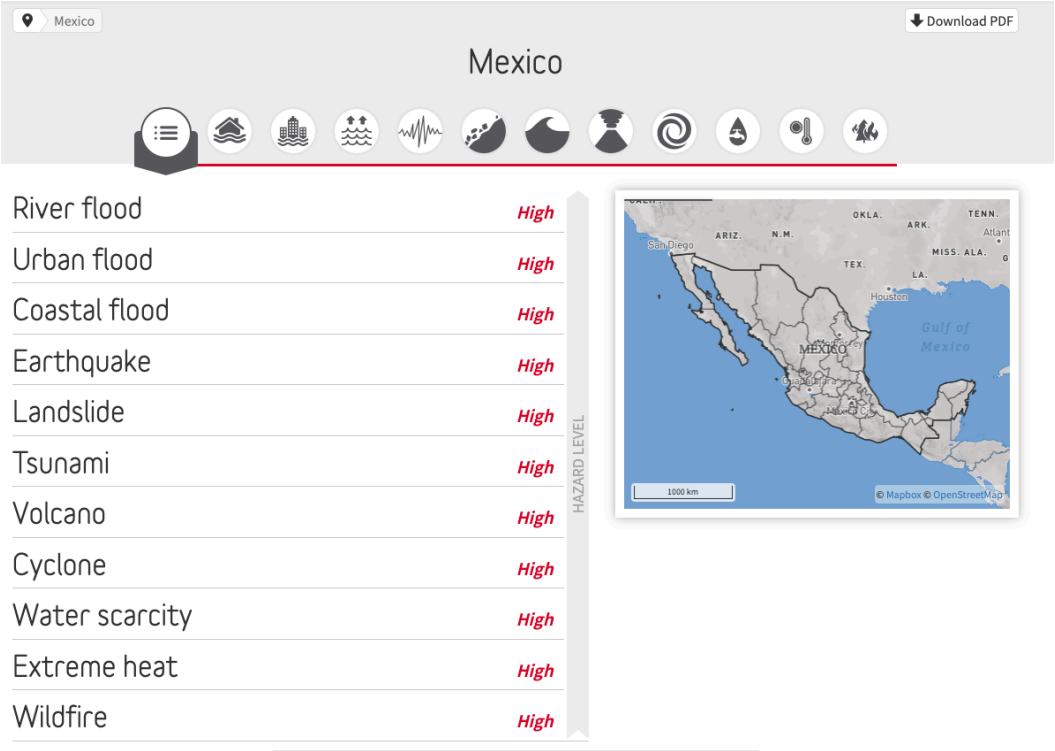
- The *Drought Risk* map shows the probabilities that the forecast SPI6 value will be equal to or lower than a user-selected drought severity level. Probabilities are displayed on a scale between 0% and 100%. The user can select a value of *Drought Severity Levels* in the dropdown menu. This level of drought corresponds to a SPI Threshold as described in the table below. The map will display the likelihood of a drought as severe or worse than the level selected, according to the SPI threshold chosen.

SPI6 Value	Drought Severity	Frequency
2.0	Severe Wetness	1 in 43-year event
1.5	Intermediate Wetness	1 in 23-year event
1.0	Moderate Wetness	1 in 11-year event
0.0	Normal	2 in 3-year event
-1.0	Moderate Dryness	1 in 11-year event
-1.5	Intermediate Dryness	1 in 23-year event
-2.0	Severe Dryness	1 in 43-year event

These two versions of the information are complementary. In one case, the consideration is what is the drought severity indicated at a given level of confidence. In the other case, the consideration is what is the likelihood that drought will be at a given level of severity or worse.

Additional Tools and Resources



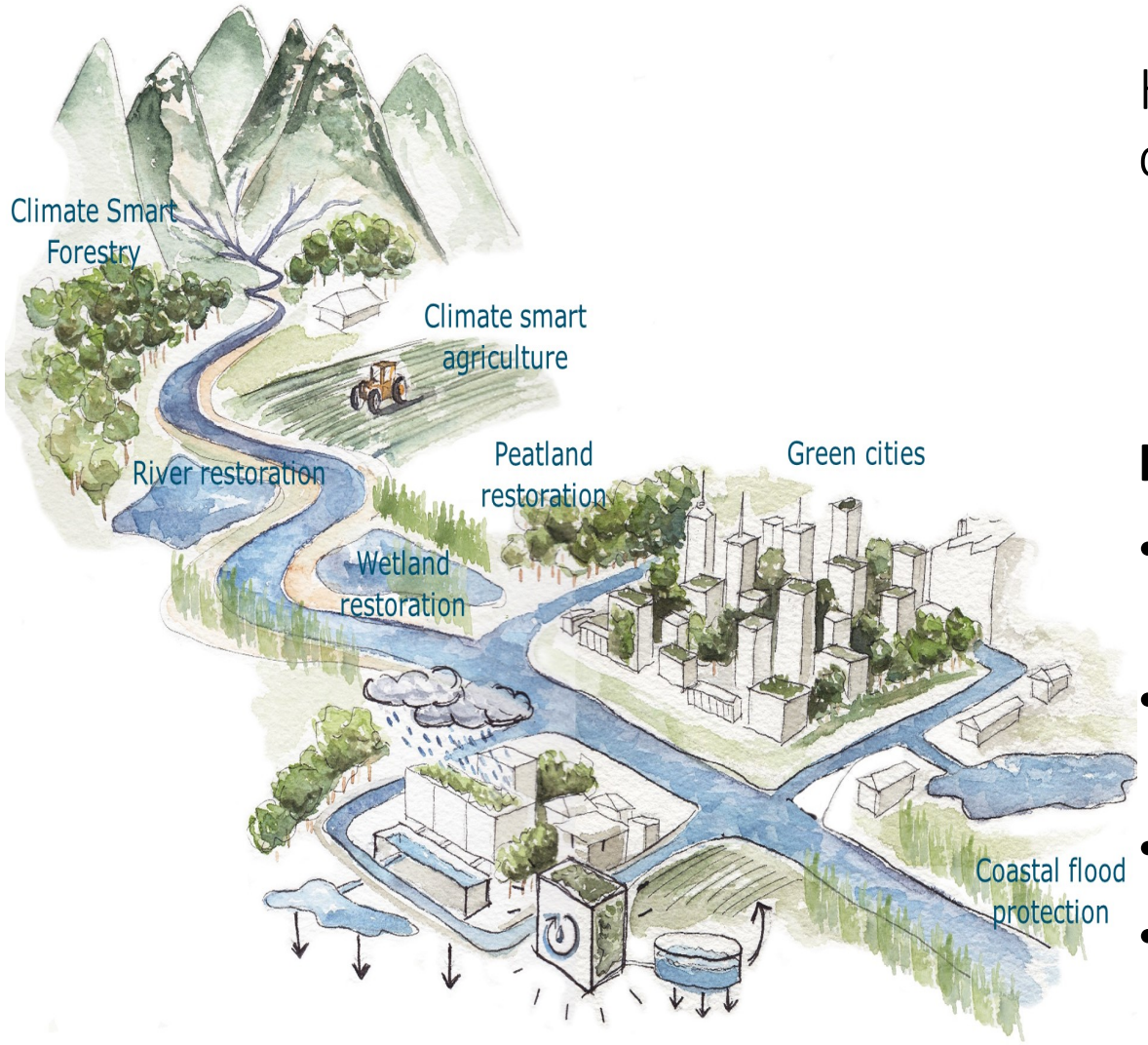


https://thinkhazard.org/en/

STAP's Question 3

Have measures to address the risks been considered? How will these risks be dealt with?

have options for adaptive management to ensure durability of outcomes been considered?



https://www.wur.nl/en/show-longread/Nature-as-the-inspiration-for-climate-solutions.htm

Information that would be useful includes:

- What are the climate risk management measures?
- How will the measure address the identified vulnerabilities?
- Evaluation of how to manage adaptively
- Feasibility, effectiveness, economic cost, tradeoffs, and co-benefits.

STAP's Question 4

What technical and institutional capacity, and information is needed?

is there a monitoring, evaluation and learning strategy for the selected climate vulnerability management options?

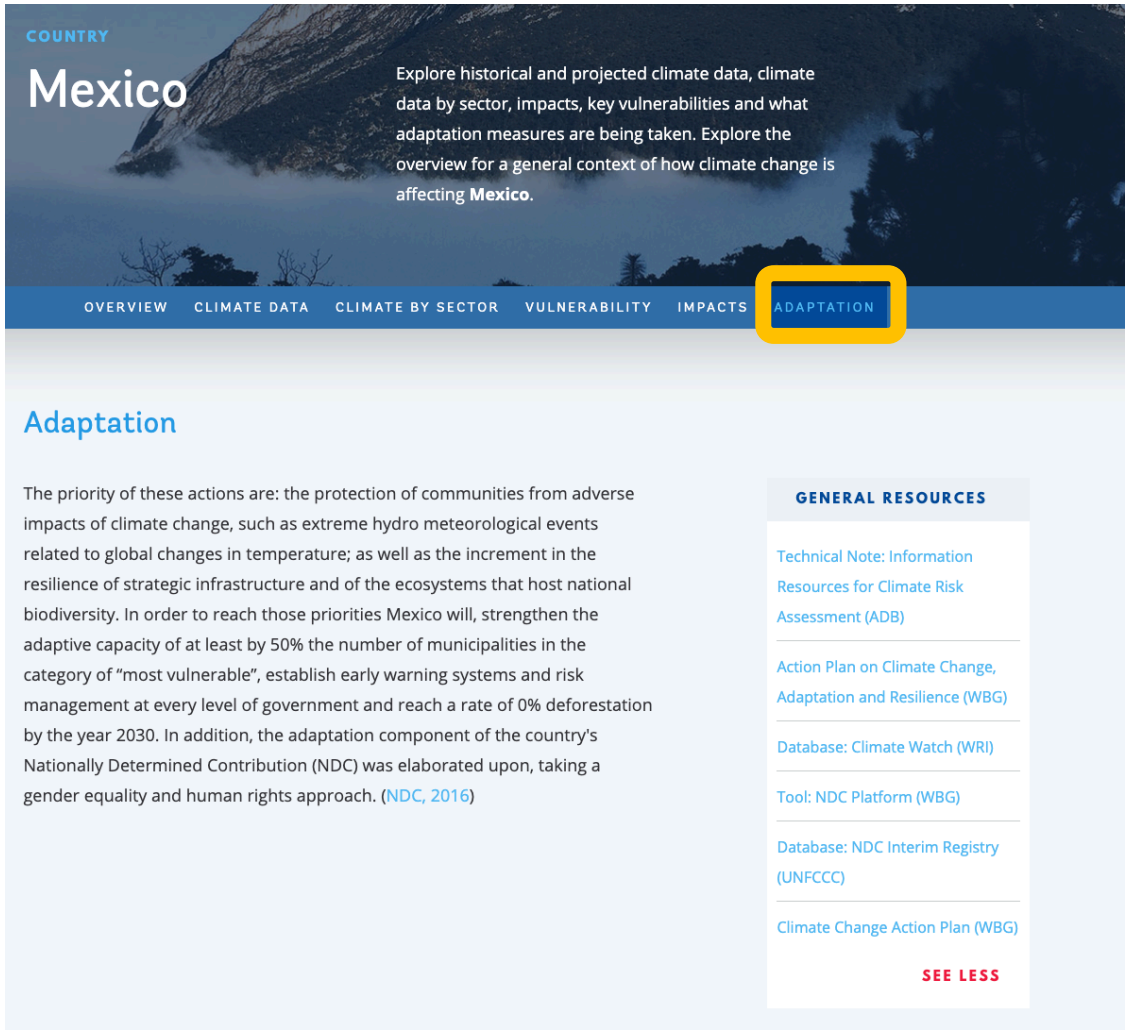
Information that would be useful includes:

- What are the needed technical and institutional capacities?
- Financial implications of climate vulnerability management options.
- Mechanisms for monitoring, evaluation and learning.

https://www.[illegible]

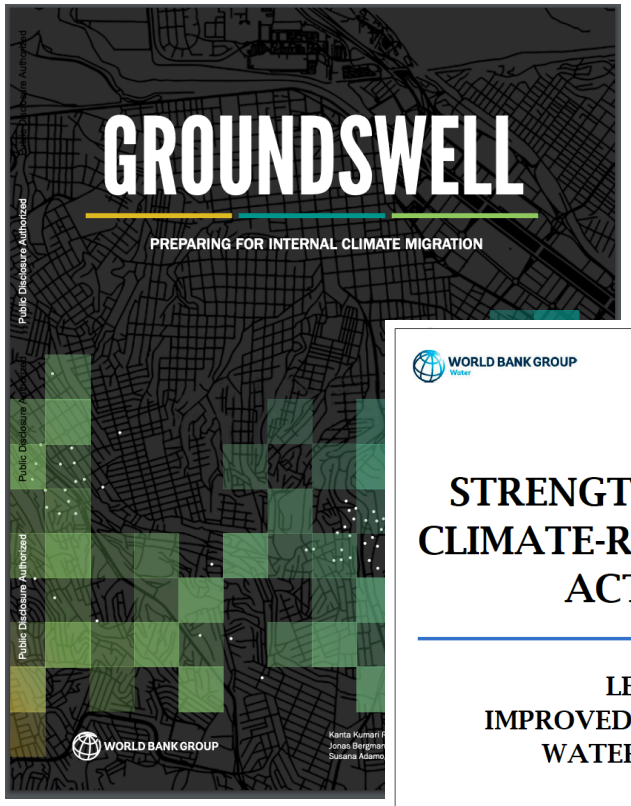
http://[illegible]/2012/09/building-the-technical-and-institutional-capa[illegible]ed-the-world/

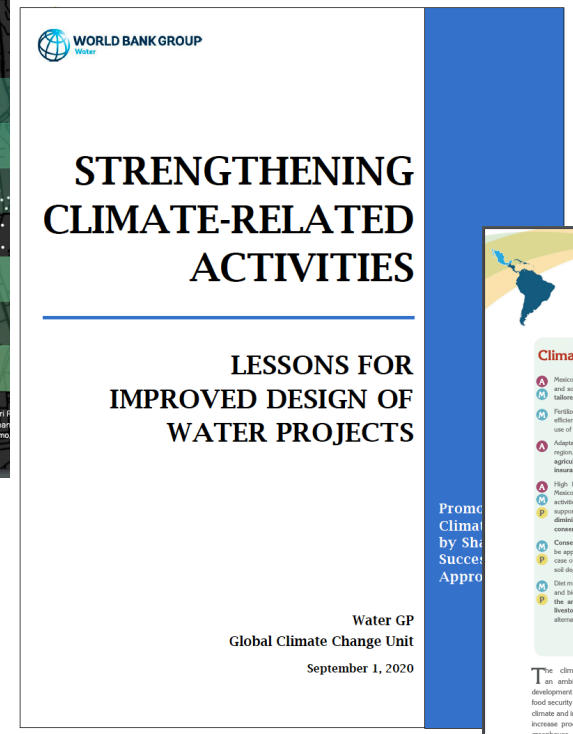
Adaptation and Key National Policies

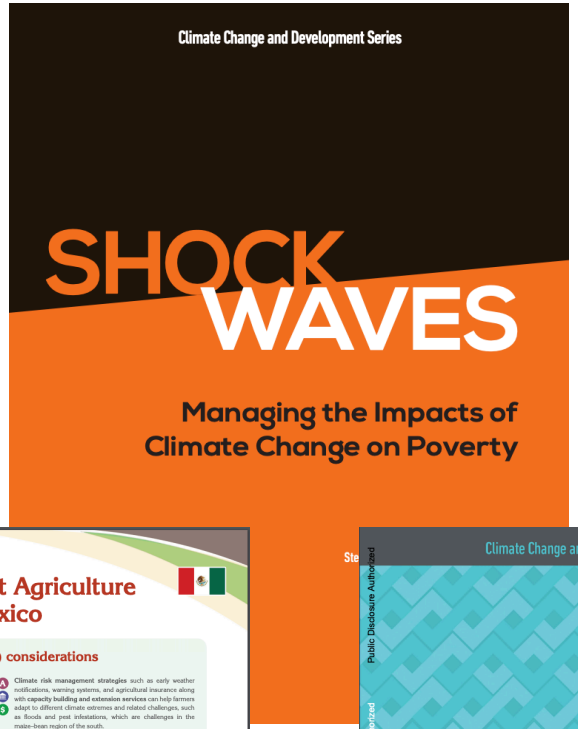


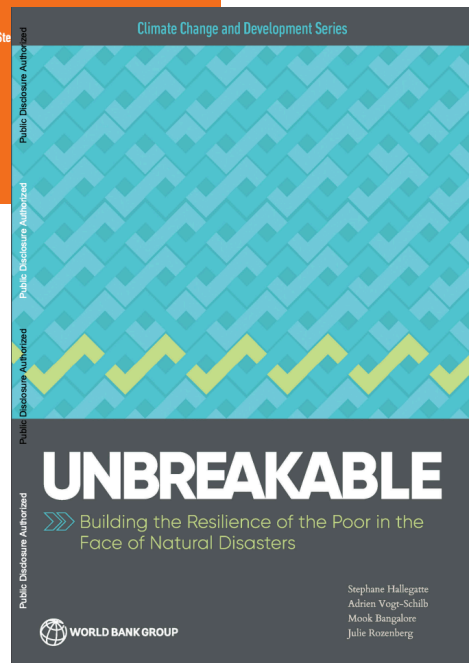
- First Nationally-Determined Contributions (2016)
- Climate Change Mid-Century Strategy (2016)
- Sixth National Communication on Climate Change (2019)
- Fifth National Communication on Climate Change (2012)
- Fourth National Communication on Climate Change (2009)
- Third National Communication on Climate Change (2006)

Additional Tools and Resources









GENERAL RESOURCES

- Mexico Climate Smart Agriculture Profile
- Technical Note: Information Resources for Climate Risk Assessment (ADB)
- Report: Groundswell (WBG)
- Book: Climate Smart Agriculture (FAO)
- Sourcebook: Climate-Smart Agriculture (FAO)
- Tool: Crop Explorer (USDA)
- Report: Shock Waves (WBG)
- Report: Unbreakable (WBG)

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