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Climate Change Knowledge Portal

For Development Practitioners and Policy Makers

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The screenshot shows the homepage of the Climate Change Knowledge Portal. At the top, there is a search bar and a 'You Are Here: Home' breadcrumb. The main content area features a world map and introductory text: 'The Climate Change Knowledge Portal (CCKP) Beta is a central hub of information, data and reports about climate change around the world. Here you can query, map, compare, chart and summarize key climate and climate-related information. [Read More](#)' and 'Click on an area of the map to get started >'. Below this is a 'Disclaimer' link.

Four featured sections are displayed in a row:

- OPEN DATA INITIATIVE:** 'World Bank Open Data Initiative' with a 'Get Data' button. Description: 'Use your creativity to integrate, visualize and synthesize climate and development data through the application of Information Technology.'
- GLOBAL CLIMATE DATA:** 'Global Climate Data' with a 'Learn More' button. Description: 'Explore and use our vast library of climate information. Chart, Map, Use historical, variability, and future projections.'
- DOWNSCALED CLIMATE DATA:** 'Downscaled Climate Data' with a 'Learn More' button. Description: 'Preview the forthcoming downscaled data! These data will enhance our information base for assessing and modeling changes in water availability, flood and drought stress and associated changes in agricultural productivity, etc.'
- WORLD BANK FINANCED ACTIVITIES:** 'World Bank Financed Activities' with an 'Explore' button. Description: 'Navigate and learn more about World Bank Financed Activities and Projects.'

At the bottom, there are four columns of navigation links:

- World Bank Documents:**
 - World Bank Documents
 - User's Guide
 - About
 - Contact
 - Site Map
- OTHER CLIMATE DATA SOURCES:**
 - IPCC Data Distribution Center
 - SERVIR
 - NOAA climate services
 - CIAT climate models
 - IRI Columbia
- ADAPTATION TOOLS:**
 - Knowledge Sharing and Reference
 - Adaptation Learning Mechanism
 - Climate Adaptation Knowledge Exchange
 - weAdapt
- MITIGATION RESOURCES:**
 - Mitigation Data Sources
 - WRI-CAT
 - Tools
 - ClimateTechWiki
 - Raegle

CLIMATE CHANGE KNOWLEDGE PORTAL

Brief User's Guidance Manual



Climate Policy and Finance Department
The World Bank



Table of Contents

CLIMATE CHANGE KNOWLEDGE PORTAL	1
BRIEF USER'S GUIDANCE MANUAL	1
WHY A CLIMATE CHANGE KNOWLEDGE PORTAL?	3
WHAT DOES IT ENTAIL?	4
MAIN PORTAL	5
GETTING STARTED	5
INFORMATION IN THE PORTAL	6
SPECIAL FEATURES	10
CUSTOM ANALYSIS TOOL	12
AN EXAMPLE OF THE ENSEMBLES OUTPUT	13
AN EXAMPLE OF THE RECURRENCE FREQUENCY STATISTIC	14
AN EXAMPLE OF THE CONFIDENCE IN CHANGE METRIC	15



Why a Climate Change Knowledge Portal?

Using climate science research results to inform the decision process about which policies or specific measures are needed to tackle climate impacts is often a difficult, yet crucial undertaking. The successful integration of scientific information in decision making often depends on the use of flexible frameworks and tools that can provide comprehensible information to a wide range of users, allowing them to evaluate how to apply it to the design of a project or policy. Despite the uncertainty on expected risks posed by climatic change, climate risk screening and adaptation tools can still provide key information regarding vulnerabilities and risks faced by specific sectors or planned activities to climate risks. In order to offer useful outcomes, these tools need to incorporate or be complemented by information on climate trends, scenarios and projections, socioeconomic data and adaptive capacity, among others, to provide clear pathways to screen climate risks and mainstream climate change into development agendas. In an effort to serve as a 'one stop shop' for climate-related data and tools, the World Bank has created the **Climate Change Knowledge Portal (CCKP)**, an online tool that provides access to comprehensive global and country data information related to climate change and development.

The portal is a web-based platform developed to assist in capacity building and knowledge development on climate and climate-related issues across the development community. Additionally, the portal was developed to help project teams to plan, monitor and evaluate project responses with respect to climate change risks. Three specific goals are targeted, meeting the needs of development practitioners:

- **Improving Integration**- Facilitating the use of social, economic and climate data to assess the relative overall level of country and regional vulnerability to climate-change; paying particular attention to the credibility, consistency, validity and usefulness of local, national, regional and international sources of information.
- **Design appropriate monitoring targets** - Identify entry points for adaptation in current and proposed projects

While it has been catalytic in addressing concerns of accessibility, the lack of readily usable spatially downscaled information limited the widespread of the CCKP within a wide range of project investment preparation. Newly integrated downscaled data and its derived products are also an integral part of the Climate Change Knowledge Portal, building a data toolkit to meet the needs of all development practitioners through three integrated entry points (Figure 1):

- **Rapid assessment on the Main CCKP site** - Integrating downscaled scenarios of climate change, allowing users to explore the implications of climate change on vulnerability indicators, and compares these with climate variability.
- Increased flexibility for space/time combination searches - on the **Custom Analysis Site** - Providing greater flexibility for analysis and custom extractions of specific areas, models, variables and time periods.
- **Direct downloads access** - Via a new downloads site which provides access to daily downscaled data for use in impact modeling across development initiatives



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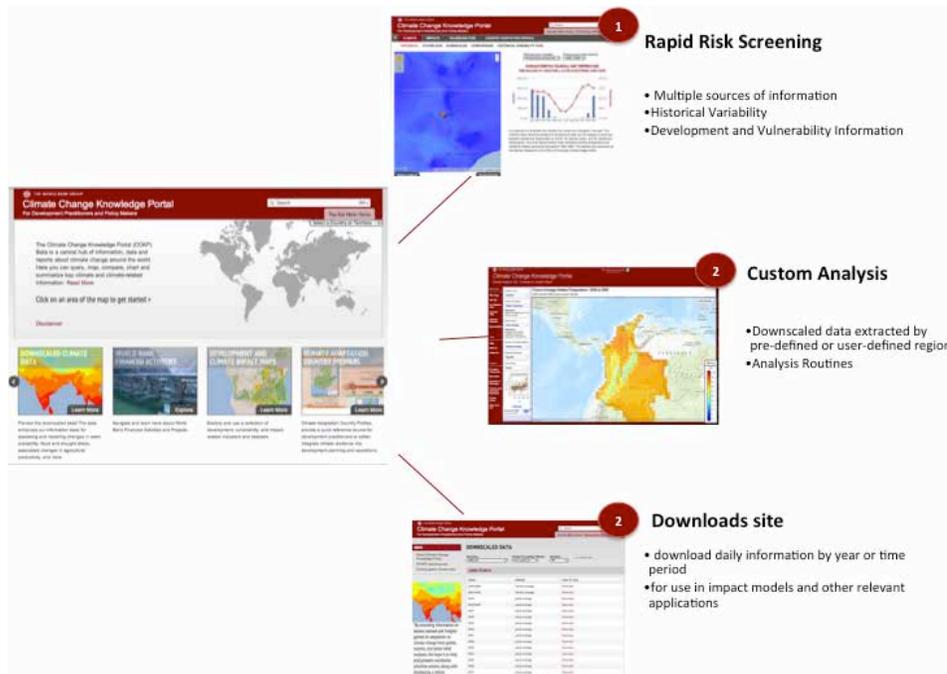


FIGURE 1: WORLD BANK'S CLIMATE CHANGE KNOWLEDGE PORTAL TOOLKIT.

What does it entail?

The CCKP is intended to provide quick and readily accessible climate and climate-related data to policy makers and development practitioners. The portal consists of a Google map interface, in which a user can query any location on the globe and receive information on historical climatology, climate change projections -from the IPCC Fourth Assessment Report ensemble of Global Circulation Models (GCMs)- and climate related information. Examples include: World Bank and external datasets related to agriculture; water runoff projections; natural disasters; socioeconomic statistics; and low carbon growth studies, among others. All of the datasets are presented both a pixel and aggregated basis (country, regional, and watershed). This portal also serve as a launching point for several other resources including country risk and adaptation profiles and other external climate related tools such as the *Adaptation Learning Mechanisms (ALM)* by UNDP, CI:GRASP by GIZ/PIK, *Climate Change Explorer (SEI)*, and *SERVIR* (USAID-CATHALAC), among others. The Portal is intended to serve as a common platform to collect, integrate, and display different levels of climate change relevant information at the global scale. Click on the **READ MORE** of the main page to learn more about the CCKP and its partners.



Main Portal

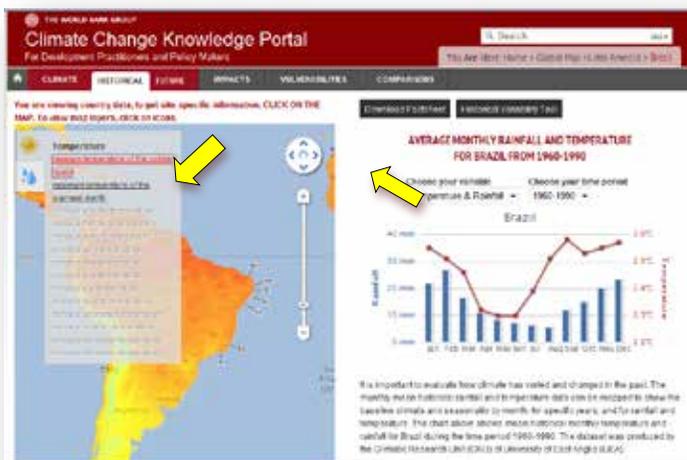
Getting Started

The CCKP functions are spatially referenced so that the maps and charts generated within the portal are a function of user selection. Thus, you need to start by selecting a region of interest within the landing page to get climate and climate related information that pertains specifically to your region. Once in a region you are requested to select a country or water basin level to visualize the data.



Once you have selected a particular location within your country or basin of interest, a set of tabs will show different queried data for the location. The first tab on *CLIMATE* will provide historical climate datasets for both Temperature and Precipitation at different time slices. Sources and description of data sources can be found at the bottom of each graph.

The majority of the CCKP data can also be visualized through the Map interface. Please click on each of the climate icons on the left corner of the map for the visualization of different mapping layers. The historical data sets also include several climate statistics that can be visualized (i.e. [minimum temperature of the coldest month](#); [maximum temperature of the warmest month](#)). Further information on databases can be sought at the *SOURCE and LEGENDS* links at the bottom of the maps.





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Information in the Portal

The portal data are organized around the tabular structure that appears below the header. These tabs include: Climate, Impacts, Vulnerabilities and Comparisons and the information contained within these tabs is described below.

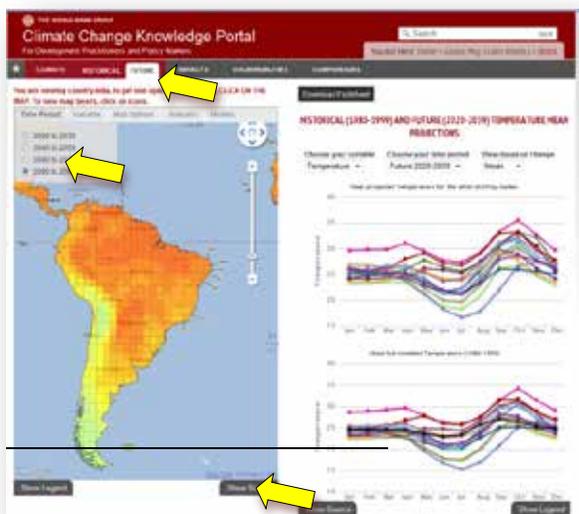


Climate Tab

The Climate tab contains three sub-tabs, each providing a different view of the available information, including:

- Historical climate
- Future climate in
 - 2 degree GCM resolution and
 - Spatially disaggregated downscaled product at 50km resolution.

The **Historical** tab data is derived from observational datasets that have been quality controlled temperature and rainfall values from thousands of weather stations worldwide (GHCN), as well as derivative products including monthly climatologies and long term historical climatologies (CRU and GHCN, WorldClim) as well derivative statistics as proxies for extreme events from these variables (WorldClim).



The GCM future climate sub-tab contains consistent outputs from 15 of the Intergovernmental Panel on Climate Change's 4th Assessment Report¹ Global Circulation Models presented at a standardized resolution of 2 degrees (200km). If you click on a particular location on the map, the chart will display the values for your chosen variable, time period and measure.

¹ The CCKP is in the process of adding the CMIP5 climate data used for the 5th Assessment Report of the UNFCCC. All data should be available by fall of 2014.



Options for the chart as well as the map display include:

- Variables: Temperature and Rainfall
- Time periods: 10 year intervals from 2020 to 2100, (e.g. 2020-2039, 2040-2059...)
- Measure: Mean in the future or change from the historical past

An envelope of model ensembles depicting the ensemble median, highest 10th percentile, and lowest 90th percentile (black lines) are also included in the observed charts. The visualization of the ensemble of all models is quite useful for understanding the potential range of climate model outcomes and a simple way to present the idea of climate model uncertainties.

The Downscaled future climate sub-tab contains information aggregated at the country or basin scale derived from 9 of the IPCC's 4th Assessment Report models. Users who wish to explore these data further are provided with a link to the **custom analysis tool** (see below) developed for these datasets, which is part and parcel of the Bank's Climate Change Knowledge Portal.

Impacts tab

As a true portal, the CCKP provides access to impact data on a wide range of climate change sectors (including agriculture, water resources, and natural disasters). Specific data includes (please see **SOURCES** for detailed information on crop varieties and model attributes):

- Ø Agricultural crop projections to 2050 and 2080 from the *GAEZ Model* of the International Institute for Applied Systems Analysis (*IIASA-FAO*).
- Ø Contribution of agriculture sector to country's overall economy, involvement of labor force in agriculture sector and comparison with percentage rural population (World Bank).
- Ø Fire Density, Flood Frequency, Tropical Cyclone Footprints from the Global Risk Data Platform, (*UNEP-GRID*).
- Ø Flood Mortality Risk, Earthquake Mortality Risk, Cyclone Mortality Risk, Drought Mortality Risk, Multi-Hazard Mortality Risk, Landslide Hazard (*CIESIN*).
- Ø Occurrence and effects of over 18,000 mass disasters in the world from 1900 to present (EM-DAT).
- Ø Behavior of key hydrologic drivers on more than 8000 watersheds across World Bank regions (World Bank).

Vulnerability Tab

Under this tab you will find

- Ø A large set of socioeconomic Indicators aggregated at the country level (*World Bank*).



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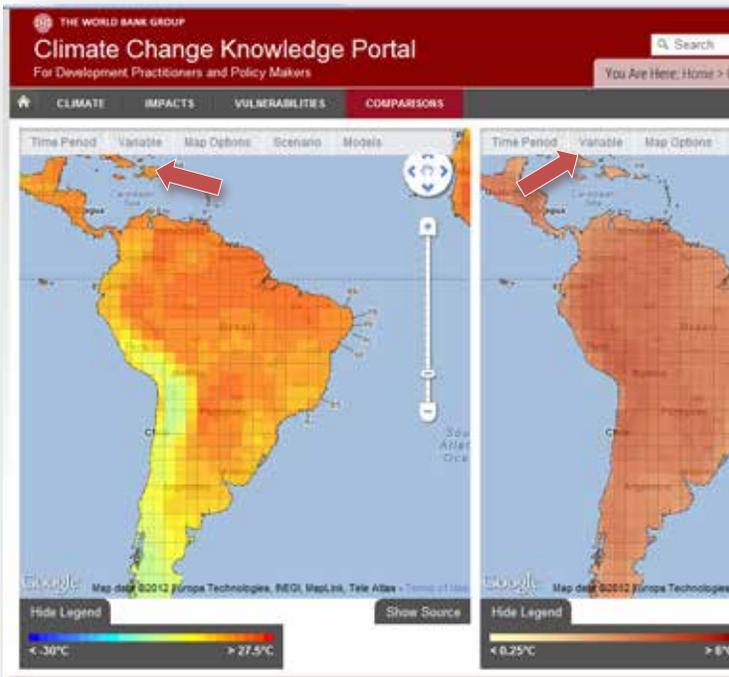
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- ∅ Visualization of several layers regarding indicators of vulnerability including data on Population, Agriculture production, and Human Nutrition.

Comparisons Tab

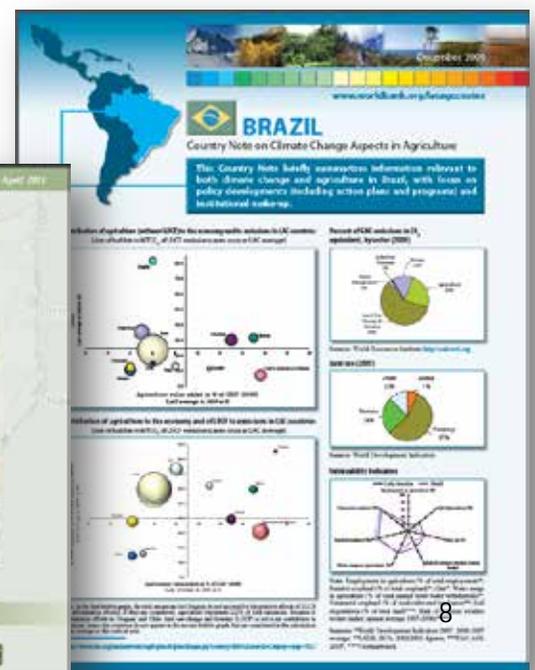
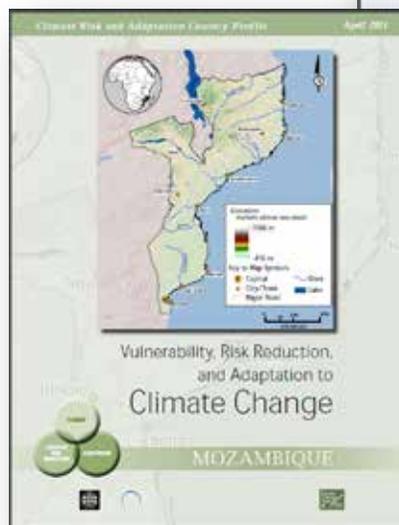
The portal provides you the ability to compare different datasets within different regions and countries. This COMPARISON tab allows you to select and observe projected changes in your area of interest.



A resource hub

The portal also provides several links to relevant resources:

- ∅ A set of policy notes on Climate Change and Agriculture for 19 Latin America and the Caribbean countries (this notes can be accessed through the Impacts/Ag tab or the Vulnerability tab).





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- Ø Country Risk and Adaptation Profiles of more than 31 countries. The country notes have been created in partnership with the Global Facility for Recovery and Reconstruction (GFDRR) (<http://www.countryadaptationprofiles.gfdr.org>).



For a smoother navigation, please make sure to always click on the **HOME icon** to return to the main page, or to select another country or basin of choice or use the bread-crum guidance to return to your location of interest.

Additional Resources

The Climate Change Knowledge Portal also includes several links to WB and external tools. Make sure you explore them as well.

ABOUT THIS SITE	OTHER CLIMATE DATA SOURCES	ADAPTATION TOOLS	MITIGATION RESOURCES
<ul style="list-style-type: none"> ▶ Why a Climate Change Knowledge Portal ▶ User's Guide (coming soon) ▶ Contact 	<ul style="list-style-type: none"> ▶ IPCC Data Distribution Center ▶ SERVIR ▶ NOAA climate services ▶ CIAT climate models ▶ IRI Columbia ▶ University of East Anglia ▶ UNDP climate profiles ▶ CI:GRASP 	<ul style="list-style-type: none"> ▶ Knowledge Sharing and Reference ▶ Adaptation Learning Mechanism ▶ Climate Adaptation Knowledge Exchange ▶ weAdapt ▶ Tools ▶ CDKP Climate-compatible development ▶ UK-CIP Adaptation Wizard ▶ CRisTAL ▶ Hands on Energy Adaptation Toolkit ▶ Others ▶ Global Adaptation Index ▶ IFPRI Food Security CASE maps 	<ul style="list-style-type: none"> ▶ Mitigation Data Sources ▶ WRI- CAIT ▶ IEA Policies and Measures Databases ▶ Technology Needs Assessment (TNA) Project ▶ UNEP Climate Change Mitigation ▶ Sustainable Energy Advisory Facility (SEAF) ▶ UNEP RISOE Center ▶ Center for Climate and Energy Solutions. ▶ Tools ▶ ClimateTechWiki ▶ Reegle ▶ Open EI ▶ Others ▶ ESMAP Website ▶ Climate Finance Options



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Special Features

The CCKP provides access to many other data and information pages. Some examples include:



CLIMATE INFORMATION MICROSITES

Tour the portal highlights in these development and climate change storylines. And take them with you!

[Learn More](#)



OPEN DATA INITIATIVE

OPEN DATA

World of data at your fingertips

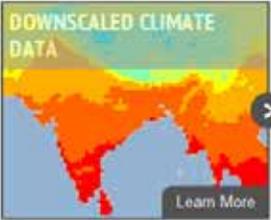
[Get Data](#)



GLOBAL CLIMATE DATA

Explore and use our vast library of climate information. Chart, map, and use historical, variability, and future projections.

[Learn More](#)



DOWNSCALED CLIMATE DATA

Preview the forthcoming downscaled data! The data will enhance our information base for assessing and modeling changes in water availability, flood and drought stress, associated changes in agricultural productivity, and

[Learn More](#)



CLIMATE INFORMATION MICROSITES

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Climate Information MicroSITES

- ∅ Access to a light version page that demonstrates user's stories on usages of climate change and development data.





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- ∅ Access to the WB Open data Initiative
- ∅ Access to new data such as downscaled climate data at http://sdwebx.worldbank.org/climateportal/index.cfm?page=downscaled_data_download

ABOUT

About Climate Change Knowledge Portal
START exploring now
Explore global climate data

DOWNSCALED DATA

About Data | Disclaimer

Type: Global Daily Data Scenario: Historical Period 1961-1999 Global Circulation Model: cccma_cgcm3_1 Variable: pr

LINKS TO DATA [List Available Data](#)

YEAR	PERIOD	LINK TO FILE
1961	yearly average	Download
1962	yearly average	Download
1963	yearly average	Download
1964	yearly average	Download
1965	yearly average	Download
1966	yearly average	Download
1967	yearly average	Download
1968	yearly average	Download
1969	yearly average	Download
1970	yearly average	Download

"By providing information on lessons learned and insights gained on adaptation to climate change from global, country, and sector-level analyses, the hope is to help

- ∅ Mapping of most WB financed activities and projects.

WORLD BANK FINANCED ACTIVITIES
Explore
Navigate and learn more about World Bank Financed Activities and Projects

DEVELOPMENT AND CLIMATE IMPACT MAPS
Learn More
Explore and use a collection of development, vulnerability, and impact-related indicators and datasets.

CLIMATE ADAPTATION COUNTRY PROFILES
Learn More
Climate Adaptation Country Profiles provide a quick reference source for development practitioners to better integrate climate resilience into development planning and operations.

MITIGATION
Explore
Learn from several examples of emerging economies actively seeking to move toward a low carbon growth path.

- ∅ Access to all climate adaptation country profiles for development practitioners to better integrate climate resilience into developing planning.
- ∅ Access to several Low Carbon Growth Studies recently developed by ESMAP.



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Custom Analysis Tool

The custom tool developed as part of the World Bank's Climate Change Knowledge Portal, in partnership with The Nature Conservancy, provides a flexible framework from which users can:

- Conduct customized queries of the downscaled data by using pre-defined regions of interest (countries, World Bank regions, Major basins of the World) or defining their own area of interest interactively
- Create their own, customized web-page of outputs, including maps, graphs, tables, and GIS data summarizing the model output for both specific grid cells and entire geographic areas and
- Download the data in formats which can be readily used in other applications and presentations.

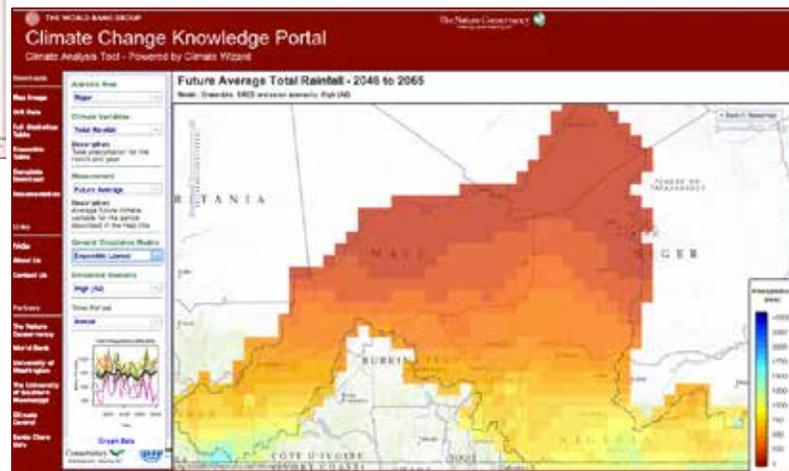


Custom site

1. User specifies his information needs



2. A customized website is created to explore these data



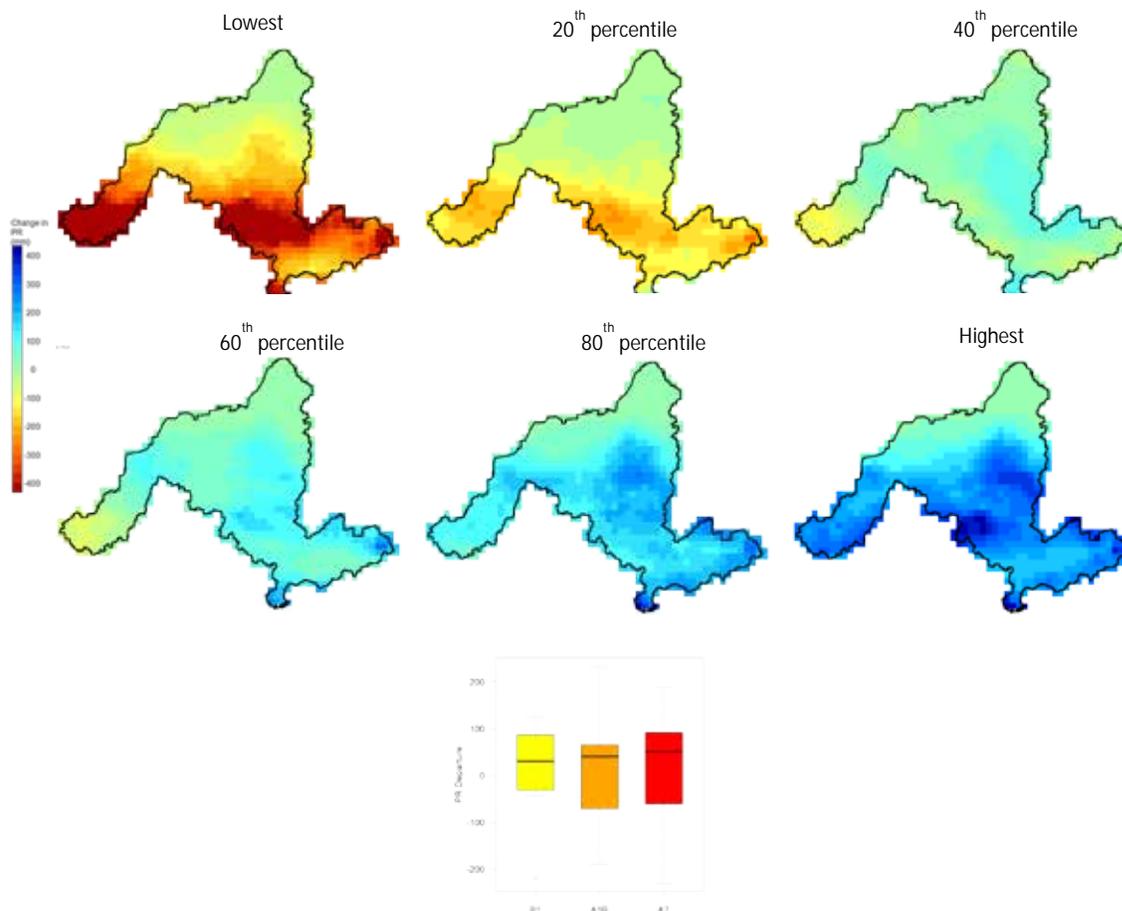
Example customized web page created for the Niger



An example of the ensembles output

What is projected to change and *Where* are these changes likely to occur?

An example of the ensembles output

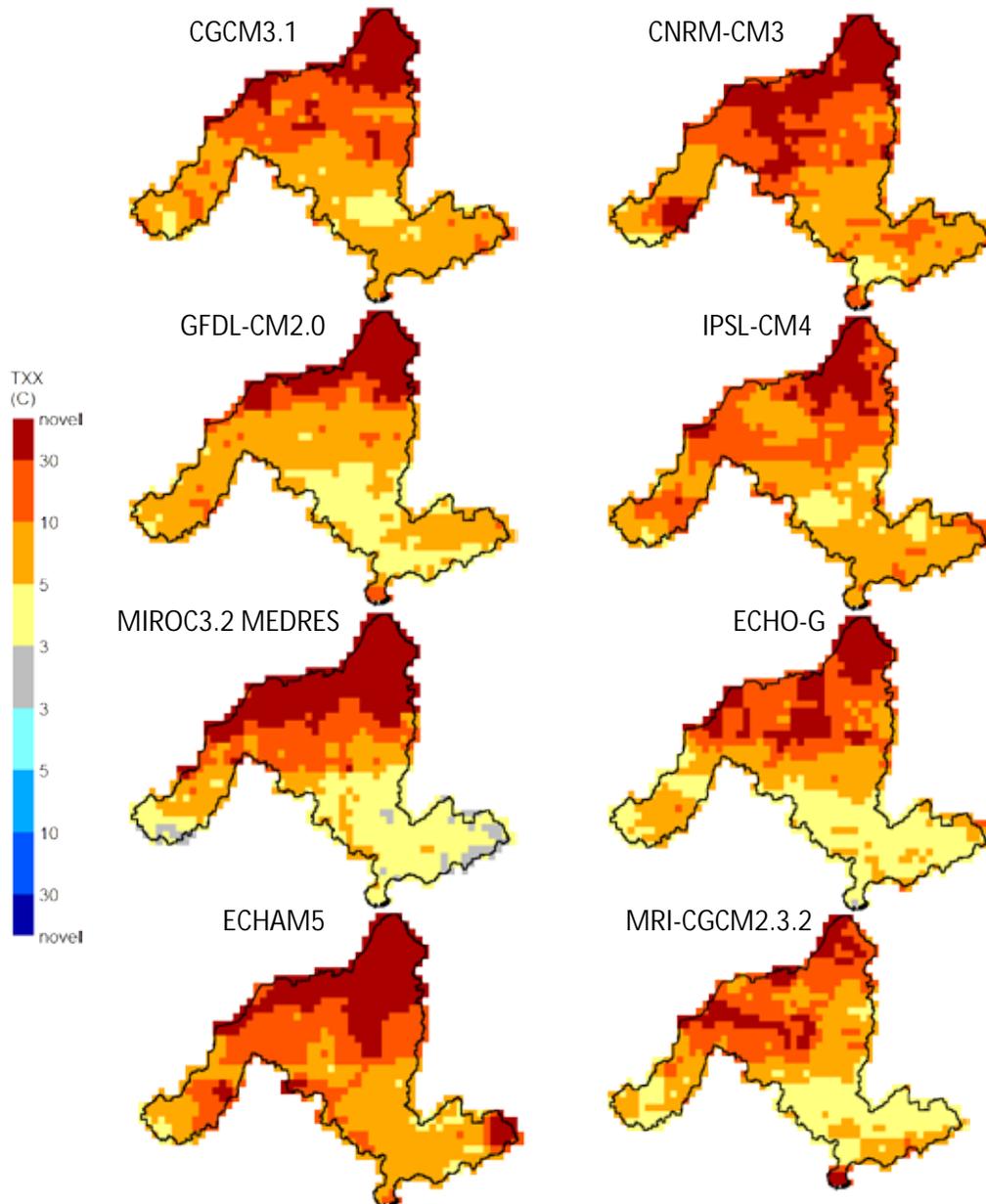


The *ensemble analyses* allow a user to focus on the range of projected changes in the future rather than directly applying the results from a single GCM. As the above example shows, there is disagreement among downscaled models on the future of annual rainfall in the Niger Basin, with some models suggesting wetter while others suggest drying conditions under the A2 emissions scenario. However, there is generally agreement that these changes are distributed across different parts of the Niger basin, as shown on the figure above. The custom site outputs also allow you to chart these data across the 3 available emissions scenarios to see how much future development pathways and their related emissions concentrations translate into projected changes in rainfall.



An example of the Recurrence Frequency Statistic

How different are projected changes from what we have already experienced?



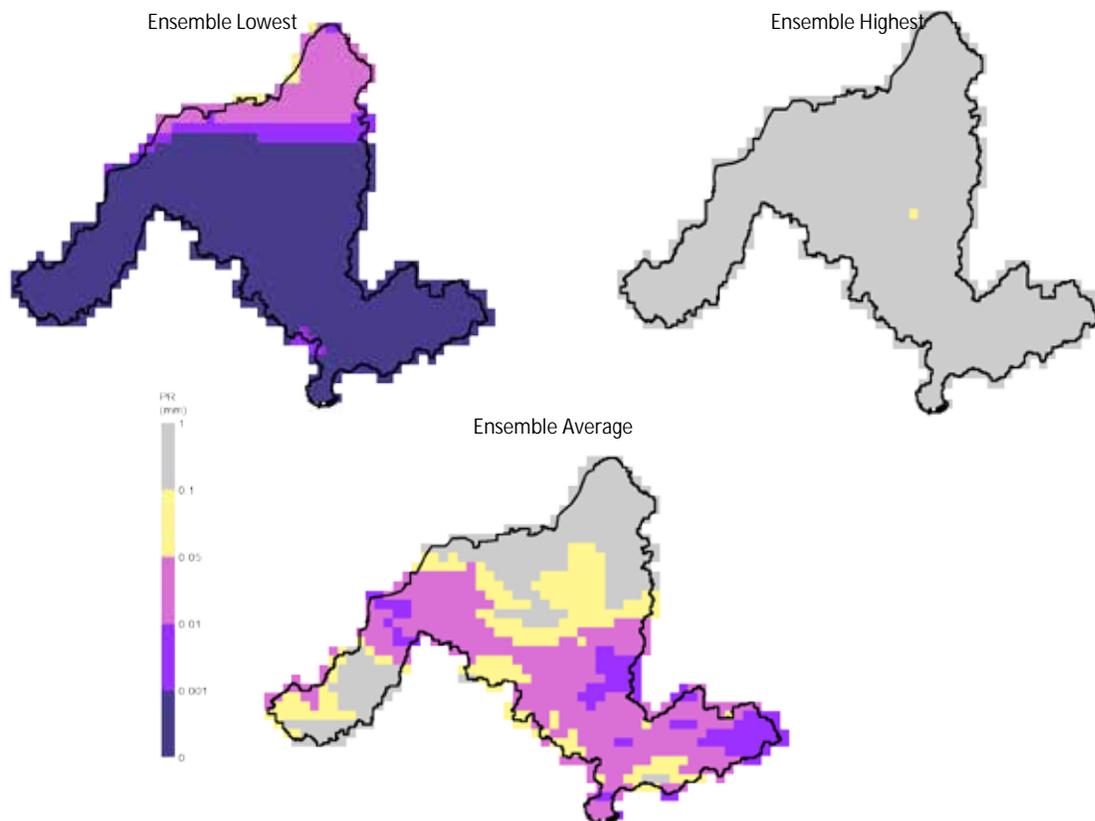
The **Recurrence Interval** metric evaluates how much more often extreme events will occur in the future than occurred in the past. In the example above, which shows the spatial distribution of this metric for the hottest temperatures on record in the Niger basin, the areas darker red point to areas where the extremes in



temperature of the past will tend to become more normal events in the future. By themselves, changes in temperatures can have significant impacts across the basin, increasing evapotranspiration, leading to declining water use efficiency of crops, changes in yields and flows.

An example of the Confidence in Change Metric

How different are these changes from our historical experience?



Confidence in change maps provides a measure of how different the future distribution of the climate variable of interest (in the case above it is annual precipitation) is from the historical to the future period based on year-to-year variation. Areas where the future will be statistically significant from the past are indicated in darker shades of purple, whereas areas in yellow or grey indicate where the projected climate will not be significantly different from the past. These maps can be generated for all variables (e.g. temperature, rainfall and proxy statistics), time periods (2046-2065 and 2081-2100) and all emissions scenarios, both on monthly and annual time scales, allowing users the ability to un-pack the high variability



and spread of model outputs into potentially significant pieces of information for decision support, such as months during which there is general agreement that rainfall will be less or more than normal.

Disclaimer

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