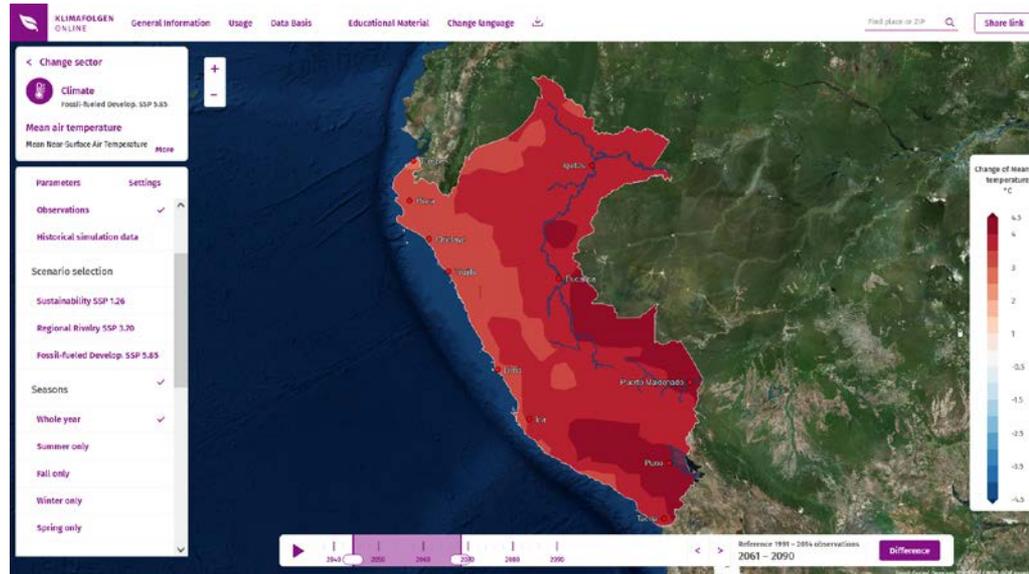


ClimateImpactsOnline: Interactive Climate Information for Peru



Thomas Nocke, Mechthild Becker

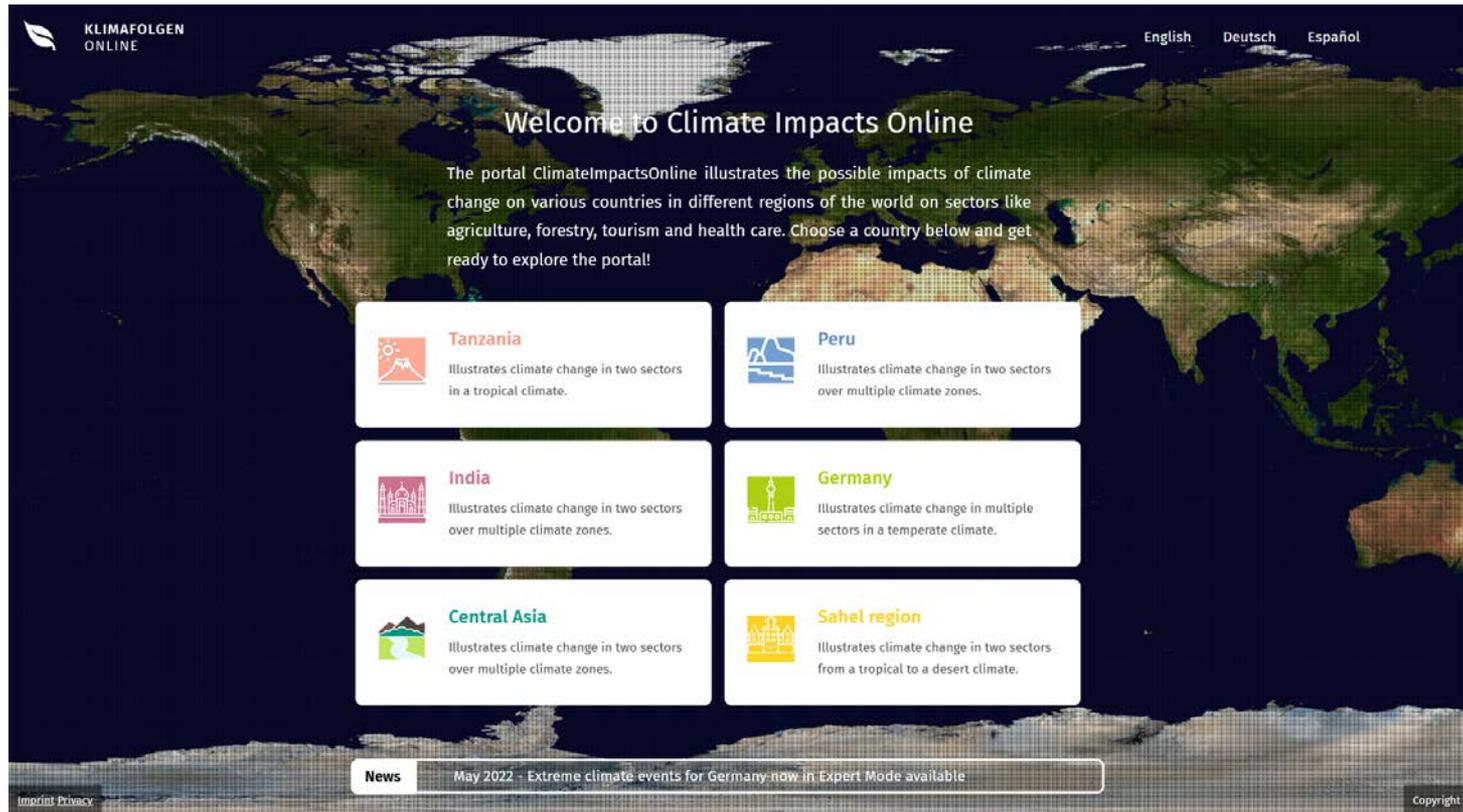
Potsdam Institute for Climate Impact Research

BEPICC Project Training Workshop 2022:

Strengthening Resilience Against Climate Change in Peru

16th – 18th August 2022, Lima, Peru

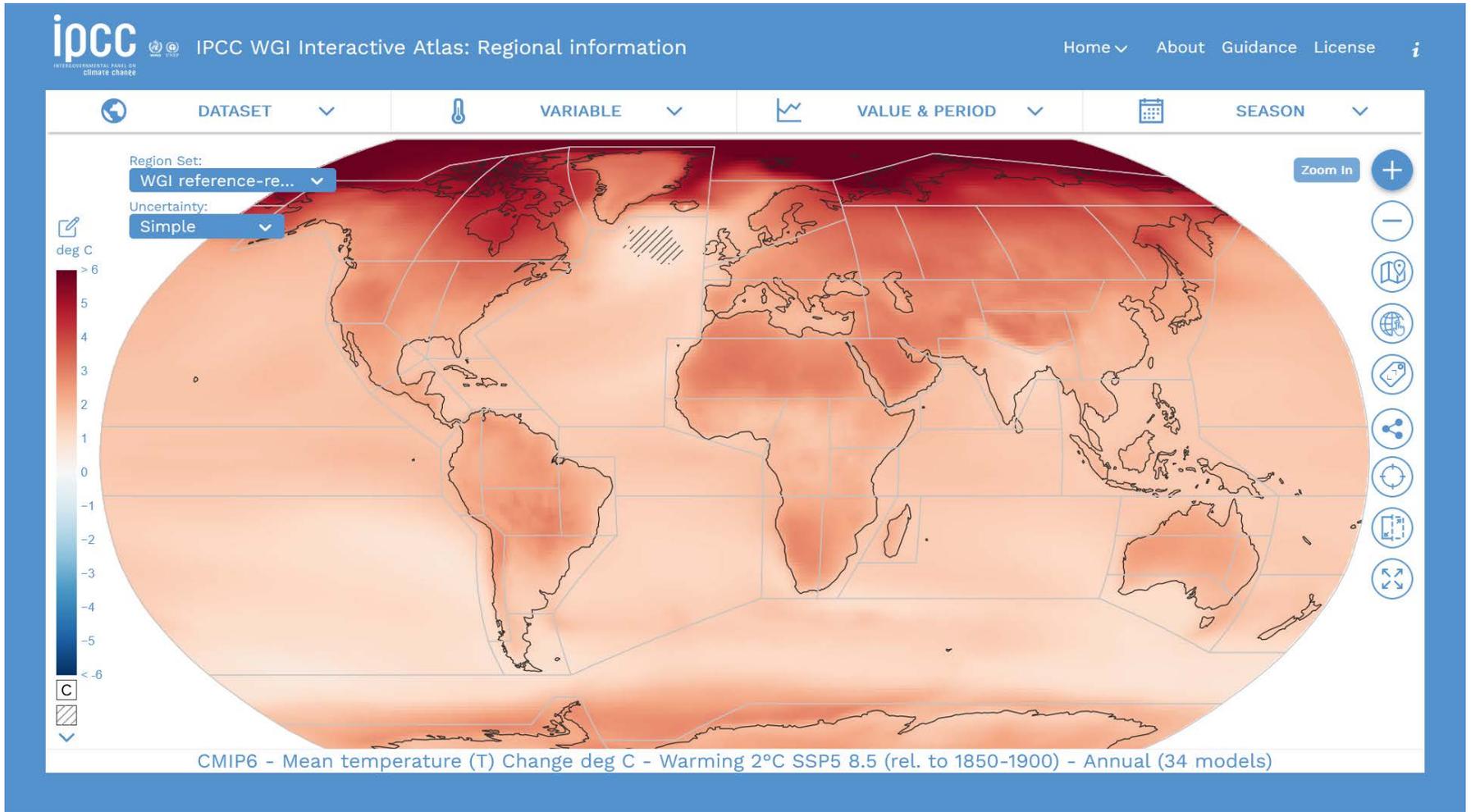
Visualization strategy



Development of an integrated web portal for multiple regions, including Peru and Central Asia

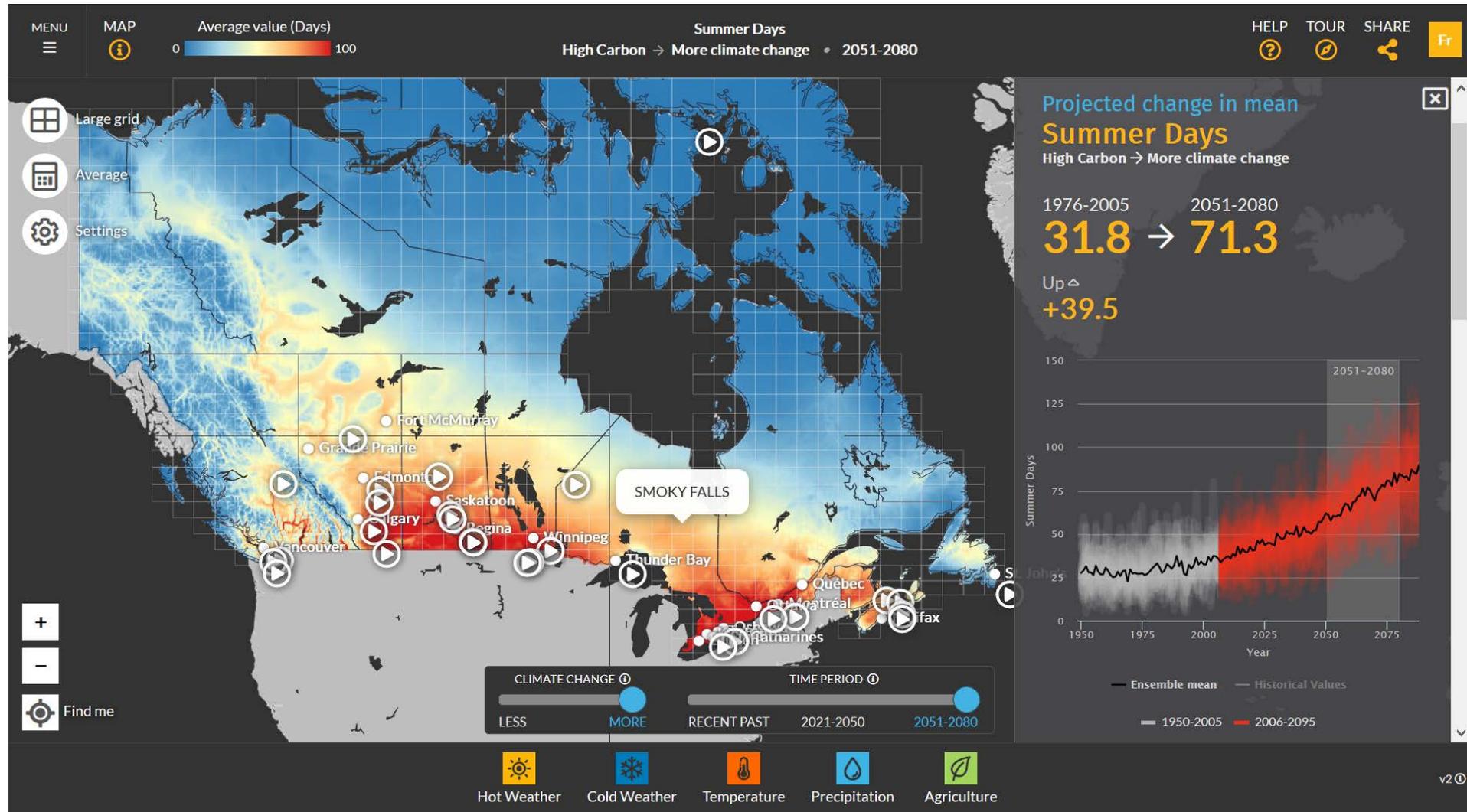
Learning from alternative solutions (1)

IPCC WG1 Interactive Atlas - interactive-atlas.ipcc.ch



Learning from alternative solutions (2)

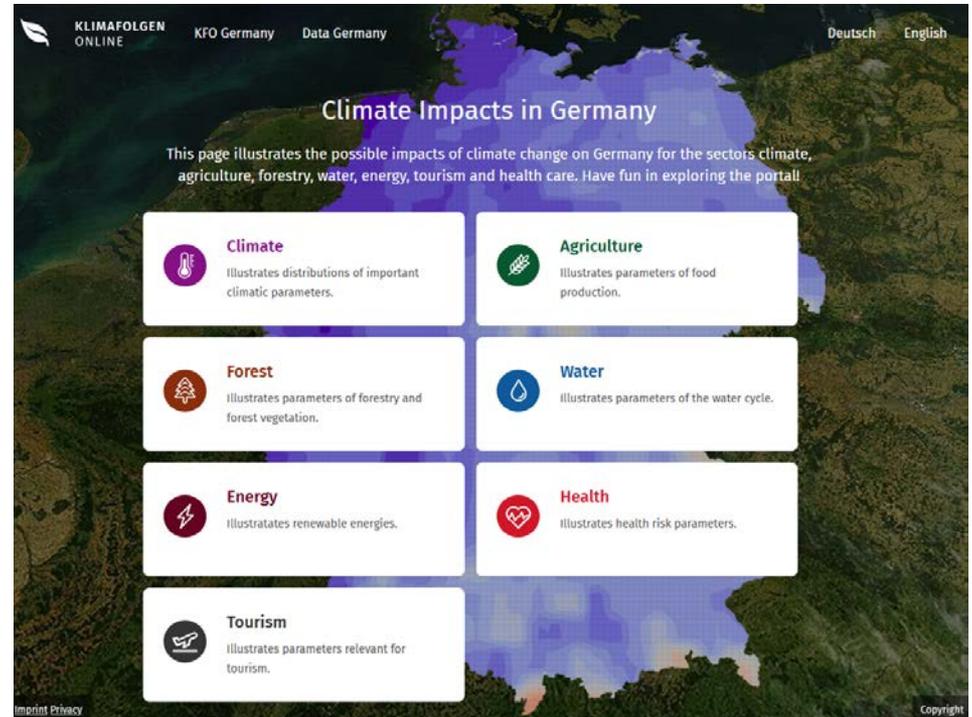
Climate Atlas of Canada - climateatlas.ca



Visualization concept for the new ClimateImpactsOnline web portal (1)

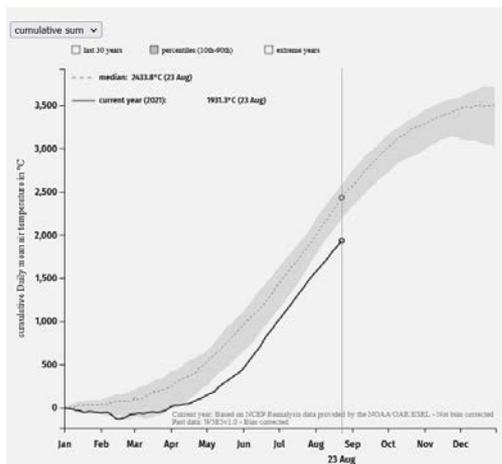


Integration of multiple regions / countries



Multiple impact sectors

Hands-On user workshops
in the target regions



Interactive infographics

Visualization concept for the new ClimateImpactsOnline web portal (2)

- **Integration of established data from multiple data sources and time frames**
 - **historic (observation & simulation), current situation, forecast and projection data; seasonal data**
 - **W5E5, ISIMIP3b, CORDEX, NCEP Reanalysis, Impact model data (SWIM, 4C), soon as well country/region specific data products**
- **Flexible data handling to facilitate the calculation of new sectors, countries and languages**
- **Provision of flexible, hierarchical regional aggregates**
 - **diagrams & tables for administrative units, protected areas, ...**

ClimateImpactsOnline web portal – Extended start page

KLIMAFOLGEN ONLINE

English Deutsch Español

Welcome to Climate Impacts Online

The portal ClimateImpactsOnline illustrates the possible impacts of climate change on various countries in different regions of the world on sectors like agriculture, forestry, tourism and health care. Choose a country below and get ready to explore the portal!

| | |
|---|---|
|  Tanzania Illustrates climate change in two sectors in a tropical climate. |  Peru Illustrates climate change in two sectors over multiple climate zones. |
|  India Illustrates climate change in two sectors over multiple climate zones. |  Germany Illustrates climate change in multiple sectors in a temperate climate. |
|  Central Asia Illustrates climate change in two sectors over multiple climate zones. |  Sahel region Illustrates climate change in two sectors from a tropical to a desert climate. |

News May 2022 - Extreme climate events for Germany now in Expert Mode available

Imprint Privacy Copyright

Automatically translated country-specific languages

The image shows a screenshot of the KLIMAFOLGEN ONLINE web application. The main interface is in Spanish, displaying a precipitation map of Peru. The map shows annual total precipitation in mm/year, with a color scale ranging from 100 (blue) to 5000 (magenta). The map is overlaid with several language-specific panels:

- Swahili:** A panel on the left side with a menu including "Hali ya hewa Observations", "Maana ya joto la hewa", "Vigezo", "Joto", "Maana ya joto la hewa", "Kiwango cha chini cha joto", "Upeo wa joto la hewa", "Kiwango cha joto la hewa", "Siku za moto", and "KUNYESHA".
- Hindi:** A panel in the middle-left with a menu including "सेक्टर बदलें", "जलवायु Sustainability SS", "हवा का तापमान सीमा", "मापदंडों", "तापमान", "मतलब हवा का तापमान", "न्यूनतम हवा का तापमान", "अधिकतम हवा का तापमान", "हवा का तापमान सीमा", "गर्म दिन", and "तेज़ी".
- Spanish:** The main interface includes a top navigation bar with "Habari ya jumla", "Matumizi", "Msingi wa Takwimu", "Maarifa ya hali ya hewa", and "badilisha lugha". The main content area shows "Cambio de sector" (Sector Change) for "Clima" (Climate) under "Sustainability SSP 1.26". It includes a "Precipitación" (Precipitation) section with a "Más" (More) link, a "Parámetros" (Parameters) section with "Ajustes" (Adjustments), and a "Duración del período de tiempo" (Duration of the time period) section with "10 yearly" and "30 yearly" options. The "Información histórica" (Historical information) section includes "Observations" (checked), "Historical simulation data", and "Selección de escenario" (Scenario selection). The bottom of the map shows a timeline from 2000 to 2070, with a "Período de tiempo 2021 - 2050" (Time period 2021 - 2050) and a "Diferencia" (Difference) button.

Swahili

Hindi

Spanish

Text improvements by (local) native speakers



Flexible seasonal data available

Close 2061 – 2090 Pacaya Samiria

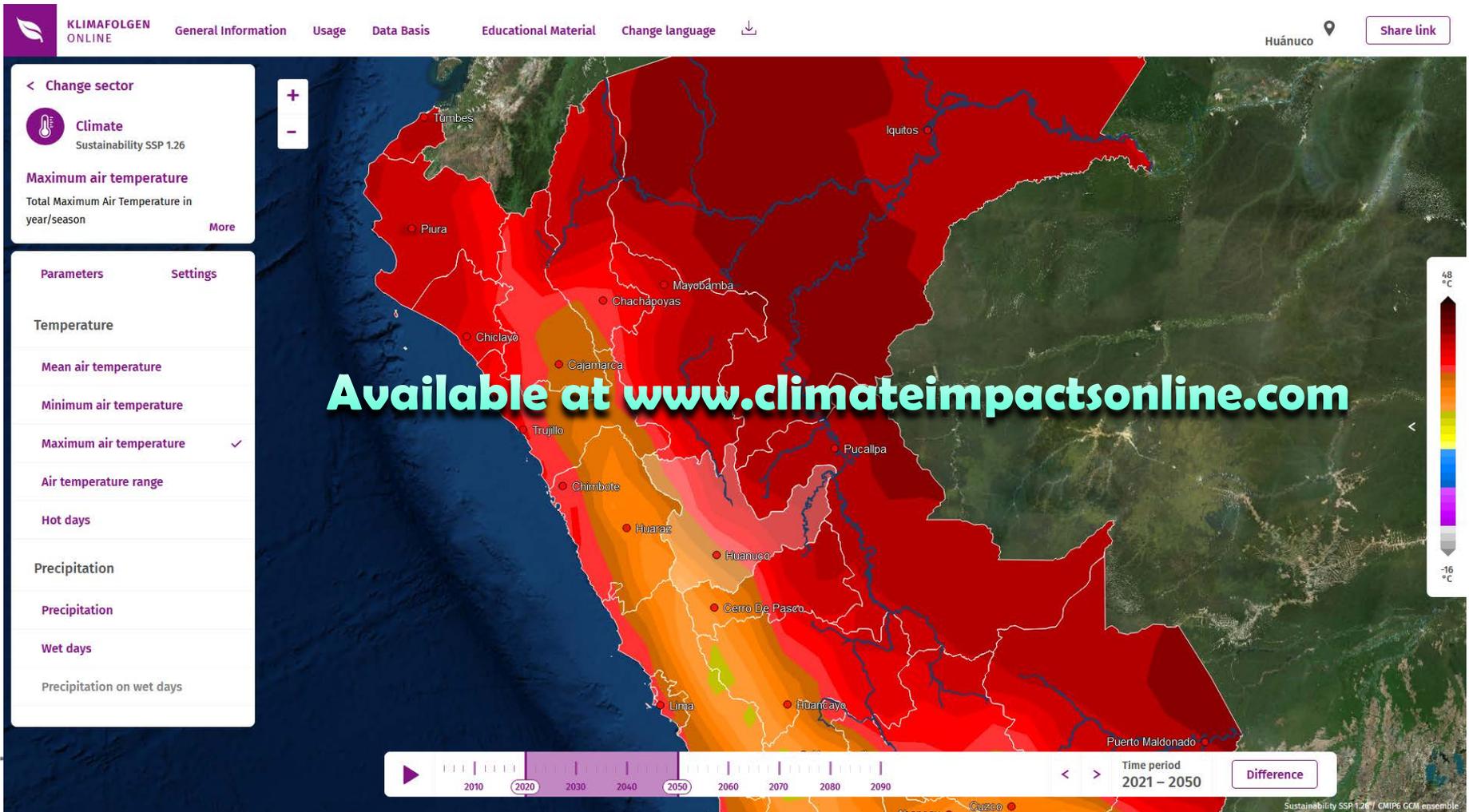
Temperature > Mean air temperature

Decadal Table

| Parameter | Year | Summer [DJF] | Fall [MAM] | Winter [JJA] | Spring [SON] |
|---|--------|--------------|------------|--------------|--------------|
| Mean Near-Surface Air Temperature [°C] | 30.9 | 30.7 | 30.3 | 30.8 | 31.8 |
| Total Maximum Air Temperature in year/season [°C] | 45.1 | 41.4 | 40.8 | 41.5 | 44.8 |
| Total Minimum Air Temperature in year/season [°C] | 21.3 | 23.5 | 23.2 | 22.1 | 23.4 |
| Maximum Daily Near-Surface Air Temperature Range [°C] | 18.7 | 16.1 | 15.7 | 15.6 | 18.2 |
| Precipitation [mm/year] | 2380.9 | 656.0 | 776.5 | 381.3 | 503.3 |
| Number of hot days [d] | 364.9 | - | - | - | - |
| Number of wet days [days] | 214.4 | - | - | - | - |

Implementation of a flexible season system handling country specific seasonality

ClimateImpactsOnline web portal – Country map view



Hands-on – test the portal

Free exploration (10 min)

Play around with...

- different zoom levels
- the time period,
- different scenarios,
- information and diagram layers,
- absolute and relative map appearance, and,
- various parameters and sectors

Prueba con...

- diferentes niveles de zoom
- el periodo de tiempo,
- diferentes escenarios,
- las capas de información y diagramas,
- el aspecto absoluto y relativo del mapa, y,
- diversos parámetros y sectores

2

Hands-on – test the portal (2)

Task 1

We will be using the 30-yearly aggregated map view at SSP 1.26. Locate the 3 big districts that shows an annual yearly precipitation ≥ 2500 mm in 2021-2050 at zoom level 2.

Now move forward in time to the time span 2061-2090 and compare the three Shared Socioeconomic Pathways.

a) How does the amount of precipitation change between these future scenarios in the three regions?

b) Does the direction of change (drier / wetter) occur similarly for all three regions of strong precipitation?

Utilizaremos la vista de mapa agregada de 30 años. Localice los 3 grandes distritos que muestran una precipitación anual ≥ 3000 mm en 2021-2050 en el nivel de zoom 2.

Ahora avanza en el tiempo hasta el periodo 2061-2090 y compara las tres trayectorias socioeconómicas compartidas.

a) ¿Cómo cambia la cantidad de precipitaciones entre estos escenarios futuros en las tres regiones?

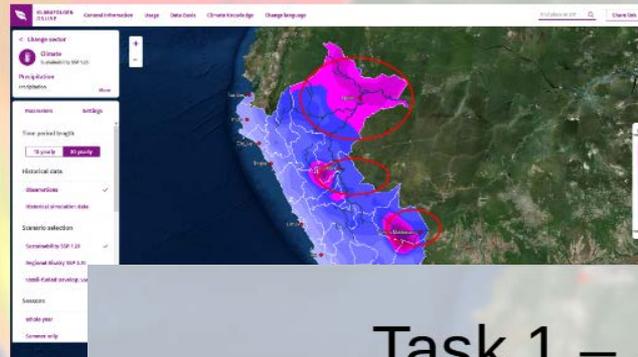
b) ¿La dirección del cambio (más seco / más húmedo) se produce de forma similar para las tres regiones de fuertes precipitaciones?

Hands-on – test the portal (3)

Task 1 – Solution (a)

The three regions are:

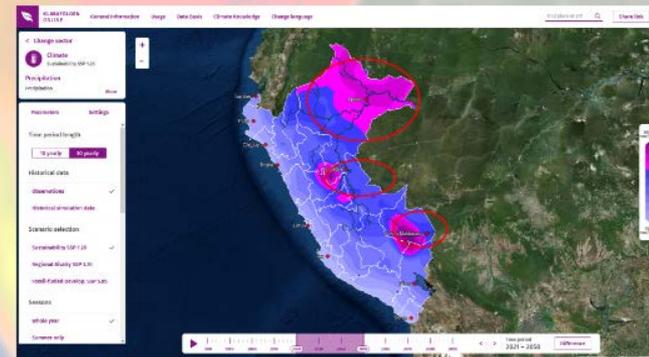
1. At the North eastern part **district Loreto** close to the city Iquitos.
2. In the central part **district Ucayali**, close to the city Pucallpa city.
3. In the southern border of Peru, at the south western of **Madre de Dios district** near Puerto Maldonado city.



Task 1 – Solución (a)

Las tres regiones son:

1. En la parte noreste del distrito de **Loreto**, cerca de la ciudad de Iquitos.
2. En la parte central el distrito de **Ucayali**, cercano a la ciudad de Pucallpa.
3. En la frontera sur del Perú, en el suroeste del distrito de **Madre de Dios**, cerca de la ciudad de Puerto Maldonado.



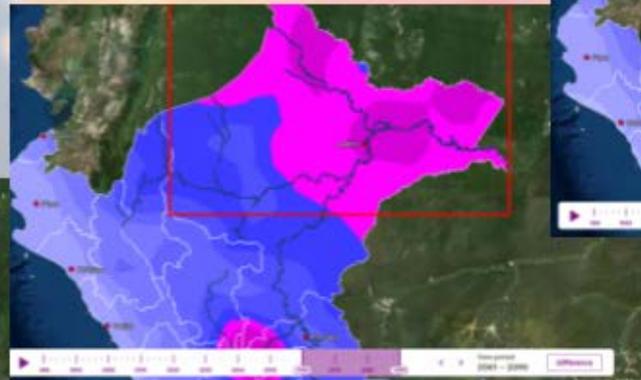
Hands-on – test the portal (4)

Task 1 – Solución (b)

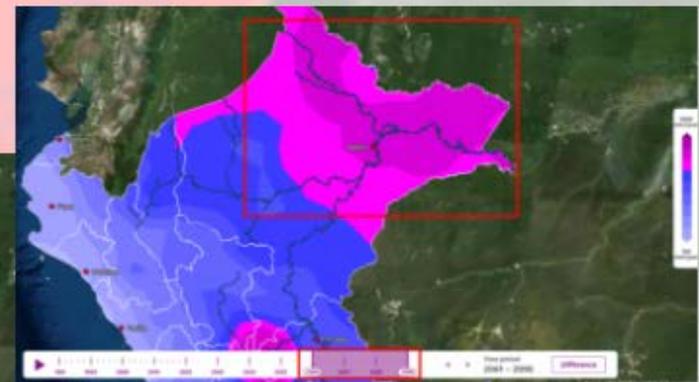
All three regions shows an opposite change behavior, towards less precipitation when changing from SSP 1.26 → SSP 3.7 → SSP 5.85.



SSP 5.85



SSP 3.7



SSP 1.26

Las tres regiones muestran un comportamiento de cambio opuesto, hacia una menor precipitación al cambiar de SSP 1.26 → SSP 3.7 → SSP 5.85.

Feedback from User Workshops (1)

Tanzania, Peru and India

Questions

- What is the applicability? How can it be used by the general public?
- What are the requirements for hosting?
- Is the inclusion of the portal on the local partner's websites possible? Is it interoperable?
- Will a smartphone / tablet version be provided in local people's interest?
- Will the data be frequently updated?

More guidance requested

- training for the platform (e.g. videos)
- short information for non-experienced user
- improved explanation of historical and future data
- transparency on data sources and their quality

Feedback from User Workshops (2)

Tanzania, Peru and India

New functionalities demanded

- Data
 - multiple concurrent data sources, in particular local sources (e.g. precipitation data for Peru, El Niño predictions); higher spatially resolved data
 - seasonal breakdown of the year (monthly, drought period)
 - new parameters (renewable energies, socioeconomic data (migration data, population ...))
 - new regions to select (rainforests, mountains, costal areas, indigenous territories, more agricultural and ecological regions); certain protected areas are missing
- Graphical user interface / functionality
 - download option for data and diagrams
 - multiple windows for easier comparison of regions or scenarios
 - More flexible selection options for time periods, percentiles, color maps etc.

Next steps / future work

Publication

New regions

- Ethiopia / Brazil

New / updated data sets

- Multiple, newly derived climatological and agricultural indices
- hydrological and agricultural simulation data for all regions based on the ISIMIP3 project and local data sets (as well for Peru)
- update data Germany

Explorative views

- More views including this year's situation

Questions for ClimateImpactsOnline in Peru

- Is data speed all over Peru sufficient for ClimateImpactsOnline?
- Which devices are typical for users in Tanzania?
- Which additional data sets should we integrate?
- Should we integrate more protected areas?
- Would further/other presentation techniques be helpful (e.g. monthly climate charts)?
- Is there a person/institute who would like to cooperate with us, e.g. who would like to provide their own parameters/indicators or helping editing information texts?

ClimateImpactsOnline: Interactive Climate Information for Peru

Thank you! Questions?

**Thomas Nocke, Mechthild Becker
{nocke|mbecker}@pik-potsdam.de**

