European Climate Data Explorer User Guide

Purpose of the European Climate Data Explorer

The European Climate Data Explorer (ECDE) provides an interactive tool embedded in Climate-ADAPT which offers access to specific climate information and data to support the adaptation efforts at different levels in Europe.

The ECDE provides access to a selection of climate indicators from the climate data store (CDS) of the Copernicus climate change service (C3S). Climate indicators are parameters that describe the changing climate without reducing climate change to only temperature, they comprise key information for the domain they inform.

The choice of climate indicators on the ECDE represent the intersection of the priorities of the European Environment Agency (EEA) and the availability of indicators in the CDS. The range of indicators available via the Climate Adapt portal will expand as more become available on the CDS.

Layout of the European Climate Data Explorer

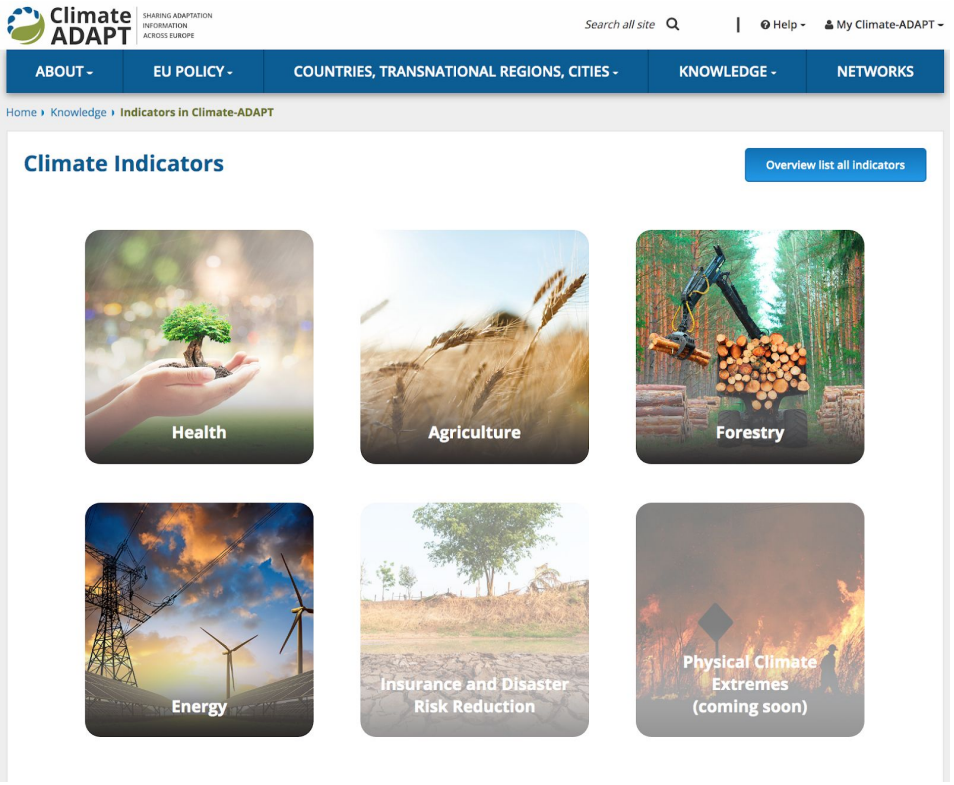

Figure 1: The theme selection page on the Climate Adapt portal

Theme Selection

From the Climate Indicators page (Figure 1) you can select a theme for which you would like to find climate indicators by clicking on the relevant image. This leads to the theme homepage from where you can navigate to an information page for each of the theme's climate indicators.

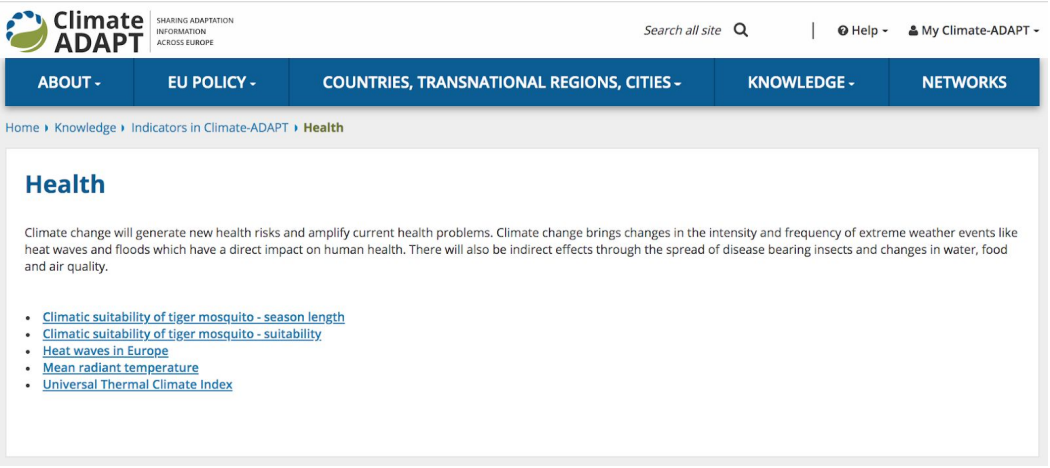

Figure 2: The Health theme page on the Climate Adapt portal with 5 climate indicators

There are 6 themes, 4 of which (Health, Agriculture, Forestry, and Energy) have indicators to explore. The remaining 2 themes: Insurance and Disaster Risk Reduction, and Physical

Climate Extremes will have indicators in due course. Figure 2 shows the layout of the page for the Health theme.

In addition to the thematic view, an overview page lists all the indicators on the Climate Adapt portal by hazard categories as defined by the European Topic Centre on Climate Change. They can be found via the “Overview list all indicators” button at the top right of the theme selection page.

Indicator Introduction Page

Links from the theme landing page, or from the overview list, lead to an indicator introduction page. An example is shown in Figure 3.

The first information page for a climate indicator is intended to be simple and clear, it contains text about the indicator above a map of the indicator’s values across Europe, and a route to explore the indicator in more detail.

The introduction text provides:

- a context for the indicator that explains its area of use,
- a brief description of what the indicator is and how it is calculated,
- the source of the data for that calculation,
- a short explanation about how the indicator values can be understood,
- a description of any climate averaging that is applied to the indicator on the map,
- a description of any viewing options,
- a short description of the information to be found on the indicator’s “explore” page,
- a link to information about the indicator in the climate data store (CDS).

A set of menu options beside the map allow you to make choices about the information that is displayed, these are fully described with menu titles, subtitles and hover-over text providing progressively more complete information. The text below these menus displays the options that have been chosen for the current data view.

An “explore in detail” button leads to an additional page where the indicator data is aggregated as national and sub-national area means.

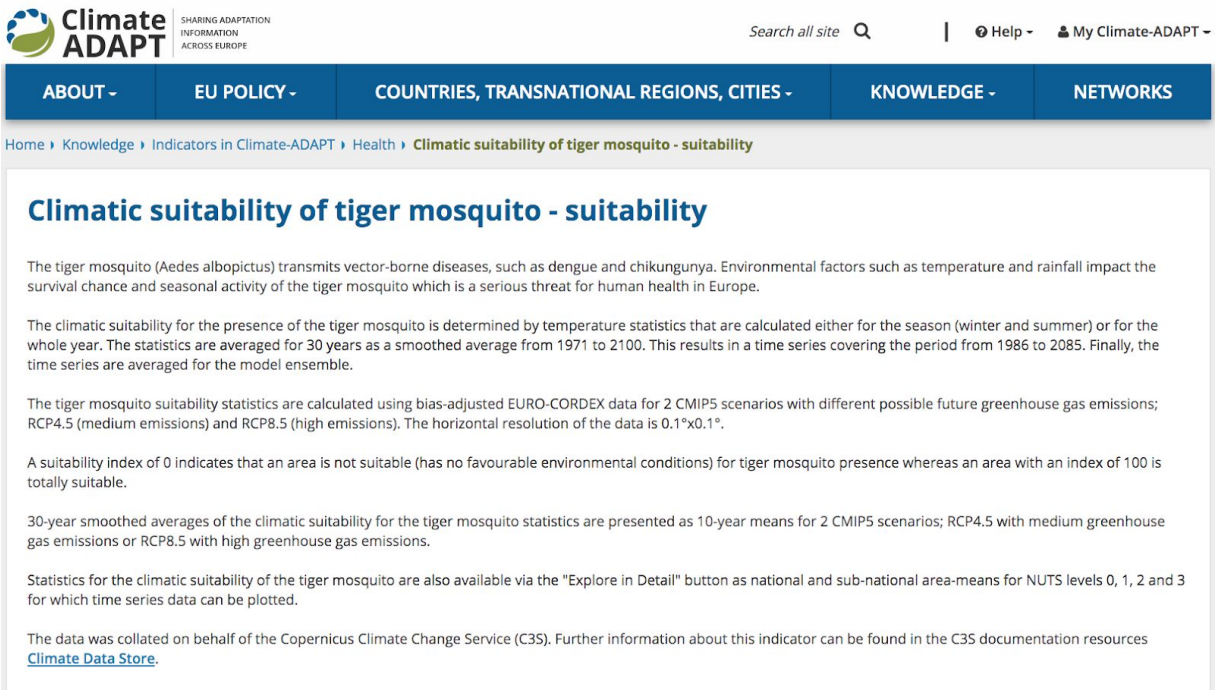

Figure 3a: Introduction text about the Health indicator: climatic suitability for the tiger mosquito - suitability index

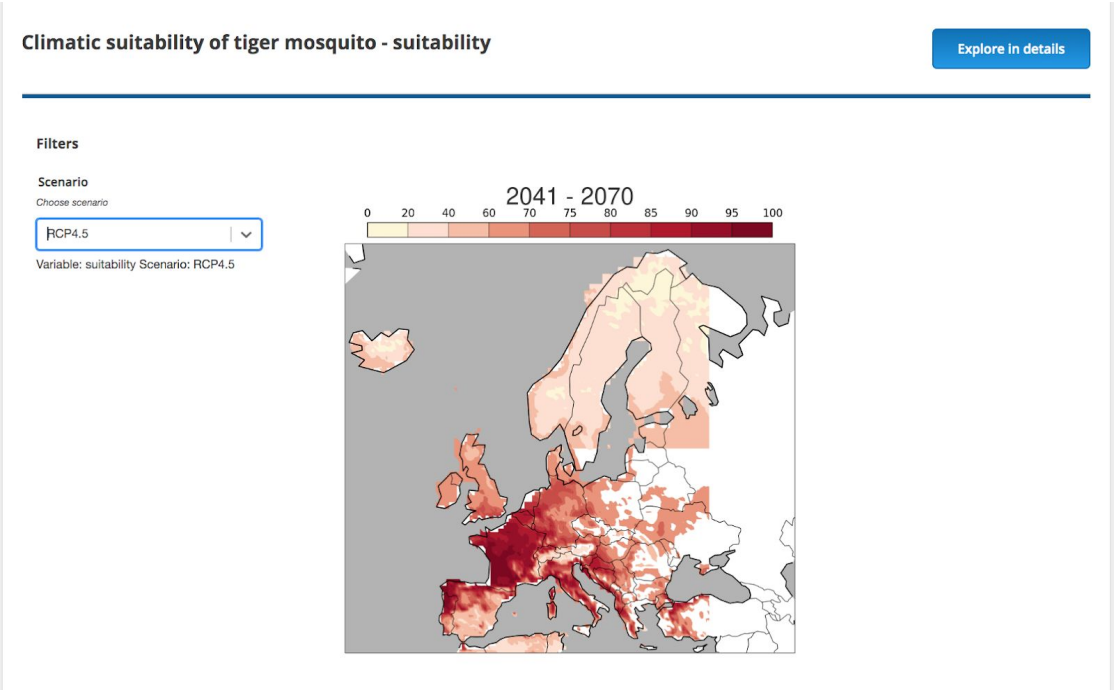

Figure 3b: Introductory data visualisation for the Health indicator: climatic suitability for the tiger mosquito - suitability index

Indicator Explore Page

The “Explore in details” button of the indicator introduction page leads to an exploration page with additional features shown in Figure 4. You can use this page to look at data which is spatially aggregated over administrative regions defined by the EUROSTAT Nomenclature of Territorial Units for Statistics (NUTS) and view time series plots for the evolution of the indicator in the region which you select.

The explore page for a climate indicator is intended to be simple and clear, it contains text about the indicator above a map of the indicator's values across Europe. The map provides dynamic access to regionally aggregated indicator data, and regional time series plots.

The explore text provides:

- a brief description of what the indicator is and how it is calculated,
- the source of the data for that calculation,
- a short explanation about how the indicator values can be understood,
- a description of any climate averaging that is applied to the indicator on the map,
- a description of any viewing options,
- a description of the regions over which the indicator data is aggregated,
- a description of how to use the map to access regional data and time series plots,
- a description of how to see the data values in time series plots,
- a link to information about the indicator in the climate data store (CDS).

A set of menu options above the map allows you to make choices about the information that is displayed, these are fully described with menu titles, subtitles and hover-over text providing progressively more complete information.

The map itself has the following dynamic actions:

- hover the mouse pointer over a region to view the value of the indicator's area mean,
- click on a region to request a time series plot.

The time series plot for the requested region will appear to the right of the map,

- hover the mouse over the time series plot to view the indicator's data values.
- click on the plot to reveal action buttons for features such as "zoom".

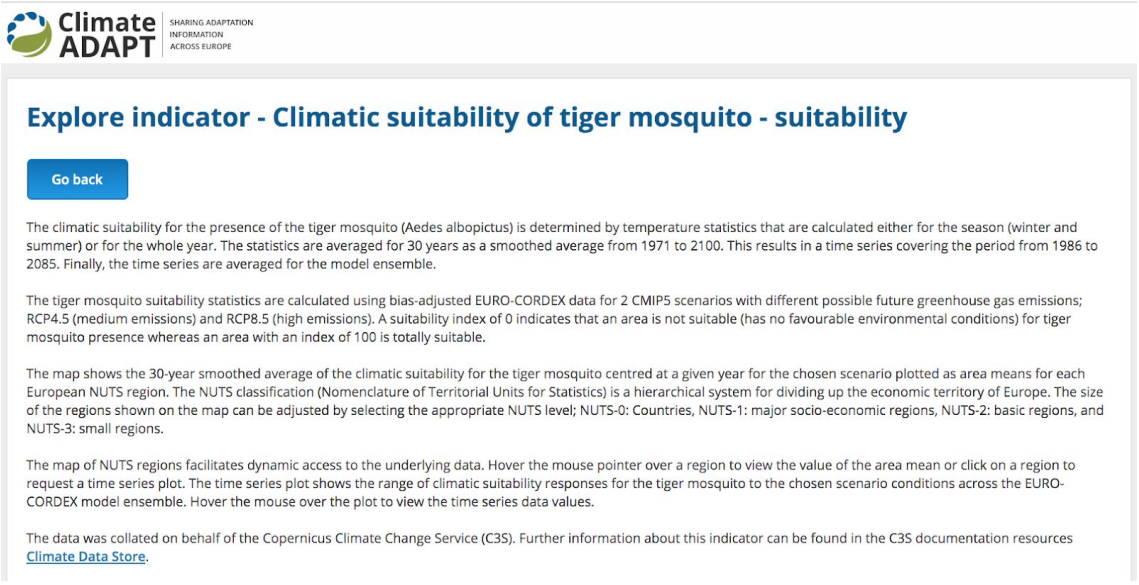

Figure 4a: Explore text about the Health indicator: climatic suitability for the tiger mosquito - suitability index.

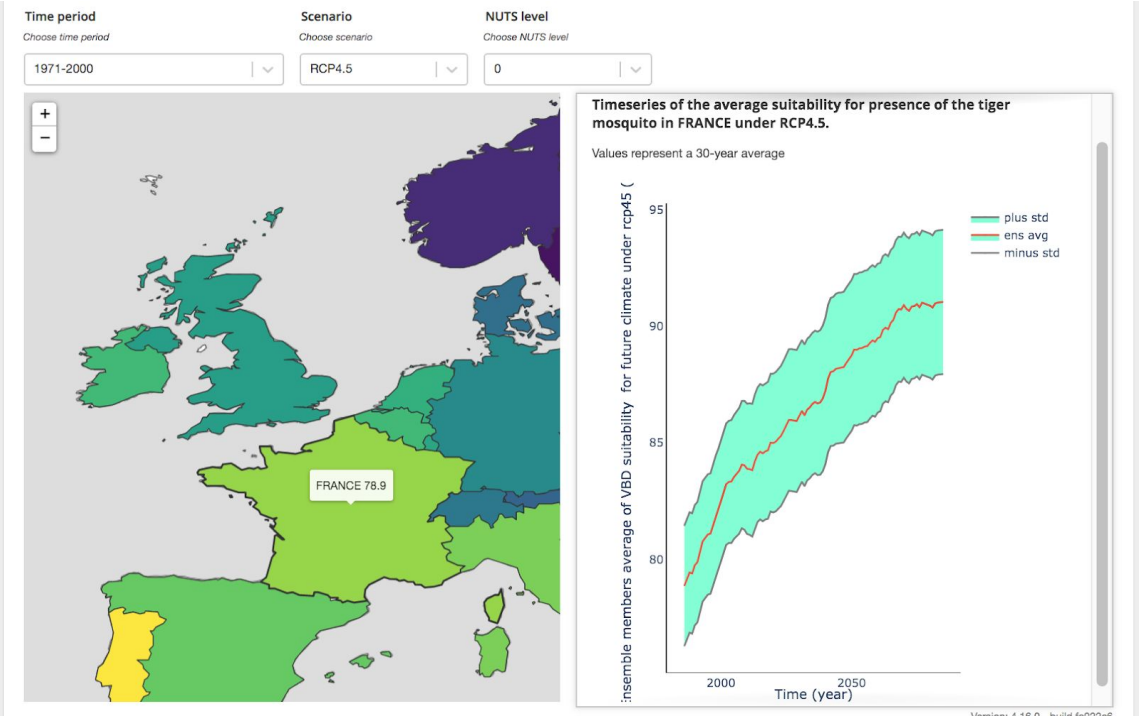

Figure 4b: Explore data visualisation for the Health indicator: climatic suitability for the tiger mosquito - suitability index. Showing a hover-over regional indicator value for France and the corresponding time series plot showing the ensemble mean and standard deviation (SD) for the chosen region and scenario. The times series data has been smoothed using a 30-year running average.

Navigation

The “Go Back” button at the top of the explore page will return you to the introduction page for the indicator. Linked breadcrumbs at the top of the page can be used to navigate to the indicator’s theme page and also to the overview page of “Indicators in Climate-ADAPT”.

Figure 6: Breadcrumbs can be used to navigate through the Climate-ADAPT portal.

Appendix

Glossary

A collection of definitions for terms that appear on climate indicator pages in the Climate Adapt portal.

Term	Explanation	Source
Air temperature	The temperature of the air above the ground in a shaded ventilated environment.	
Apparent temperature	The apparent temperature is a measure of relative discomfort due to combined heat and high humidity and is calculated as a combination of air and dew point temperature.	
CMIP5	Climate modelling groups coordinate their model updates and simulations around the schedule of the Intergovernmental Panel on Climate Change (IPCC) assessment reports. A Coupled Model Intercomparison Project (CMIP) is a coordinated set of simulations run by many different models. The 2013 IPCC fifth assessment report (AR5) featured climate model simulations from CMIP5.	https://www.carbonbrief.org/cmip6-the-next-generation-of-climate-models-explained
Dew point temperature	The temperature to which air must be cooled to become saturated with water vapour.	
ECMWF	European Centre for Medium-Range Weather Forecasts	http://www.ecmwf.int
ERA5	ERA5 combines vast amounts of historical weather observations into global estimates using advanced modelling and data assimilation systems.	https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era5
ERA5-HEAT	ERA5-HEAT is a global gridded historical dataset of human thermal comfort indices calculated from the ERA5 climate reanalysis.	https://doi.org/10.1002/gdj3.102
GCM	Global Climate Model. Climate models use equations to represent the processes and interactions that drive the Earth's climate. These cover the atmosphere, oceans, land and ice-covered regions of the planet.	https://www.carbonbrief.org/qa-how-do-climate-models-work
mean	The mean is the average of a set of values, it is the sum of the values divided by the number of values.	
model ensemble	When different Global Climate Models (GCMs) are set up to run simulations which all follow the same instructions for starting conditions, historical data and projected data, that suite of simulations is known as a model ensemble.	
NUTS	The EUROSTAT NUTS classification (Nomenclature of Territorial Units for Statistics) is a hierarchical system for dividing up the economic territory of the EU and the UK. NUTS-0: Countries, NUTS-1: major	https://ec.europa.eu/eurostat/web/nuts/background

	socio-economic regions with a populations between 3 million and 7 million, NUTS-2: basic regions for the application of regional policies with populations between 800 000 and 3 million, and NUTS-3: small regions for specific diagnoses with populations between 150 000 and 800 000.	
percentile	In statistics, a percentile (or centile) is a value below which a given percentage of the values in the data distribution lie.	https://en.wikipedia.org/wiki/Percentile
RCP2.6	RCP2.5 has an emission pathway that is representative of scenarios that lead to very low greenhouse gas concentration levels. Radiative forcing peaks at around 3.1 W/m2 in the mid 21st century and declines to 2.6 W/m2 by the year 2100.	https://skepticalscience.com//rcp.php
RCP4.5	RCP4.5 is a stabilisation scenario in which total radiative forcing stabilises at 4.5 W/m2 shortly after the year 2100.	https://skepticalscience.com//rcp.php
RCP8.5	RCP8.5 is characterised by increasing greenhouse gas emissions over time, it is representative of scenarios that lead to high greenhouse gas concentration levels and has a radiative forcing of 8.5 W/m2 in the year 2100.	https://skepticalscience.com//rcp.php
relative humidity	The amount of water vapour in air as a percentage of the amount of water vapour needed for saturation at the same temperature.	
running average	A running (or moving) average is applied to timeseries data to smooth out short-term fluctuations and highlight longer-term trends. The points inside a time window are averaged and the window “runs” along the time axis.	https://en.wikipedia.org/wiki/Moving_average
Scenario	CMIP5 scenarios are called representative concentration pathways (RCPs). They are representative in that they are one of several different scenarios that have similar radiative forcing and emissions characteristics.	https://skepticalscience.com//rcp.php
SD	Standard Deviation. The standard deviation is a measure of the amount of variation in a set of values. A low standard deviation indicates that the values tend to be close to the mean, while a high standard deviation indicates that the values are spread out over a wider range.	https://en.wikipedia.org/wiki/Standard_deviation