

How CLIMEX is being used

Climate Change

Climate change has a similar effect on a species as relocation to a new environment. Climate change alters the environment around the population rather than the species experiencing a new environment by being introduced into a new area.

CLIMEX provides a facility to create customised climate change scenarios for a defined region. The effects of climate change on the seasonal suitability for population growth and on the extent of limiting climatic conditions can be explored.

Quarantine Pest Risk

CLIMEX enables the potential success and hence geographical distribution of a species to be determined. This enables the risks from exotic species to be defined in terms of the regions at risk in an importing country. It also allows the identification of seasons and locations where entry and establishment are most likely to be successful.

CLIMEX can therefore be used to estimate the area at risk as an input to an economic analysis of potential damage following introduction. CLIMEX information is useful for importers to protect local industries and for exporters to negotiate foreign access for their products. CLIMEX is currently being used by quarantine services in several different countries.

Biological Control

CLIMEX is a favourite tool in biological control because it facilitates the targeting of collection and release sites for bio-control agents. Climatic analyses provide invaluable insights into the likely behaviour of species when introduced into a new environment.

Biogeography

CLIMEX provides insights into the climatic mechanisms that limit the geographical distribution of a species in different parts of its range. Further, the program enables the climatic conditions that favour population growth to be identified.

Species-specific stress indices are available for each location, showing the limiting effects of extreme temperatures or moisture on the local populations.

Gradients of suitability of habitats for a species in terms of climate can be identified and related to the spatial abundance of species.

Locations in other continents with comparable climates can be identified.

Policy

Policy makers have special needs for information. They deal with a wide range of issues and need to be able to absorb important information rapidly and without struggling to interpret mathematical or dense textual information. Many of their decisions relate to large geographical areas.

CLIMEX addresses these needs by presenting results visually as circles of different sizes on maps to show the relative suitability of the climate in different parts of a country for a target species. It is possible to display further tables and graphs to illustrate the features of the climate and the species' response in that location in more detail. Grid-based climate data can also be used to run CLIMEX.

Education

Universities and senior schools are searching for educational software that addresses topics currently in their curricula, rather than adding items to already crowded curricula. Such software has to be well supported with teachers' resources, tutorials and prepared questions to minimise the workload on overworked teachers. It must also be enjoyable for the students and relate to their own experiences.

CLIMEX provides all of these advantages and it has been described as being 'addictive' to students (and researchers), who are captivated by the insights that it provides. It addresses curriculum topics such as skill building in scientific methodology through iteration, simple simulation modeling, geography, biogeography and climatology. In addition, examples illustrate many of the applications above (biogeography, quarantine pest risk, climate change, and biocontrol) and students appreciate being able to **use the actual software tools that are being used by researchers and policy makers.**