



Evaluating climate suitability for agriculture based on agroclimatic indices

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With climate change increased water shortage and extreme weather events during the cropping season may cause more frequent crop loss, yield instability, and make cultivated areas less suitable for traditional crops. In order to develop long-term agricultural policies, planners need to understand the likely impacts of climate change on the climate suitability for different cultivation types. Agroclimatic indices have great potential to communicate the impacts of climate change. However, each metric only represents a specific aspect of climate that may or may not be relevant for the growth of a certain crop type. To guide planners and policy makers, different indices have to be aggregated in a comprehensible manner. We present a framework for estimating agricultural suitability for major crops in Switzerland. The framework is based on (a) an evaluation of agroclimatic indices for relevant phenological phases of a range of crops, (b) an aggregation of the individual indices into crop specific suitability indices and (c) a further aggregation to obtain an overall suitability index. This allows for taking into account that climate change may lead to significant shifts in growth phases and sensitive periods. As suitability is computed for individual years, the method also provides the possibility to evaluate inter-annual variabilities. Thus, it can give an indication on the risk of crop failure, which is important for discussing risk management in relation to adaptation to climate change.