CASANDRA: Web based platform to assess impacts and define adaption strategies to climate change.

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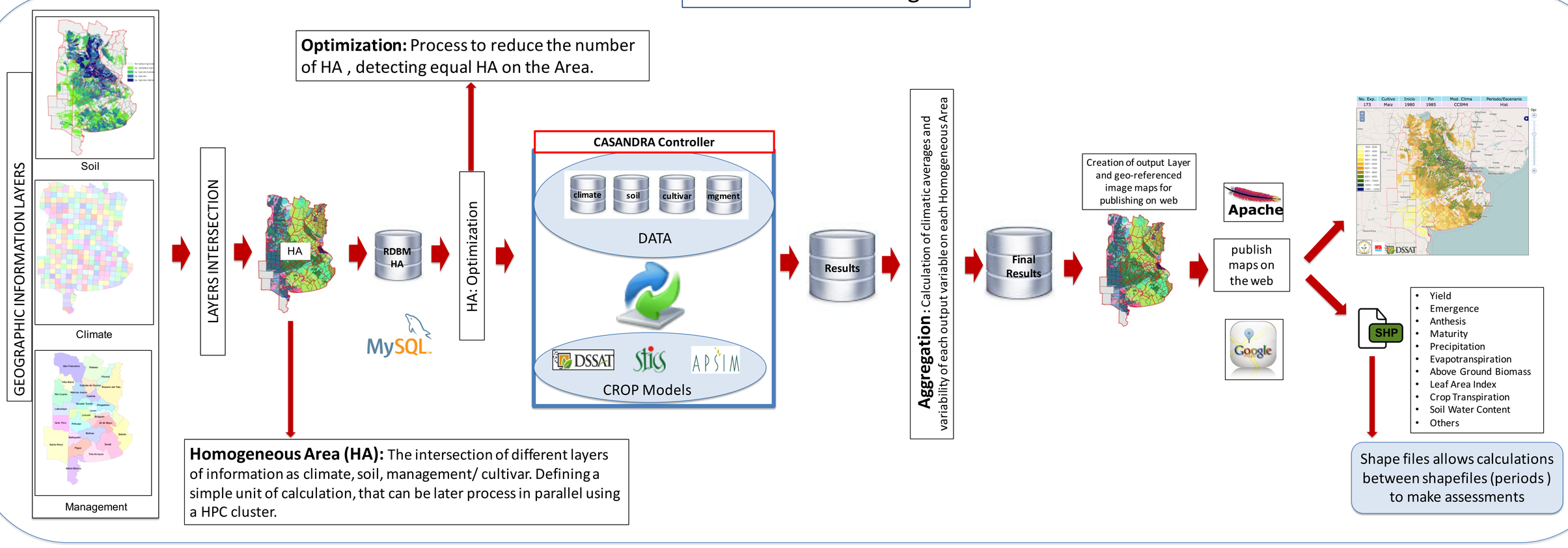
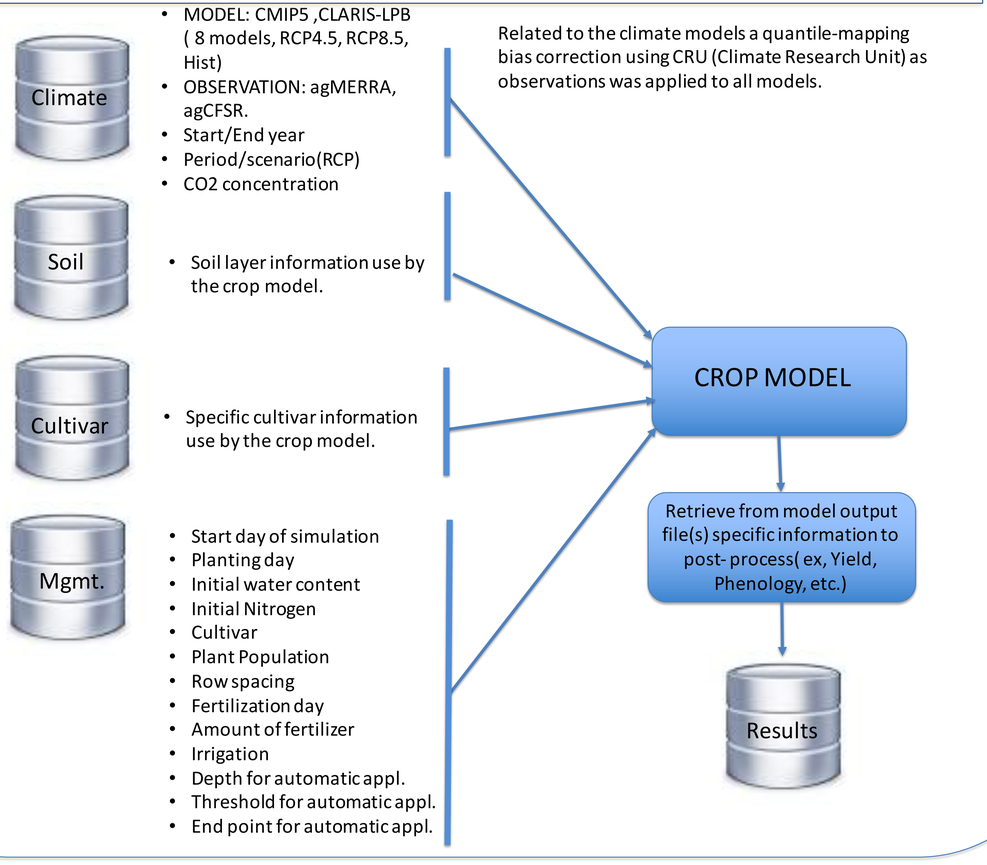
Crop models are used to assess or estimate yield among other important variables such as phenology, dry matter, LAI, soil water content, soil and water management, as well as to evaluate different climate or management scenarios at a particular site. On the other hand, problems involving regional climate change include various spatial scales, and would benefit from simulations over large areas using high-resolution climate data spatially distributed (CMIP5, reanalysis, etc.). The geospatial web platform "CASANDRA" was developed to solve the spatial scale problem allowing to combine different site specific crop models (DSSAT, APSIM*, STICS*) with different climate scenarios and typical regional management. This way, it is possible to visualize impacts at both spatial and temporal level and also evaluate different regional adaptation strategies.

CASANDRA block diagram

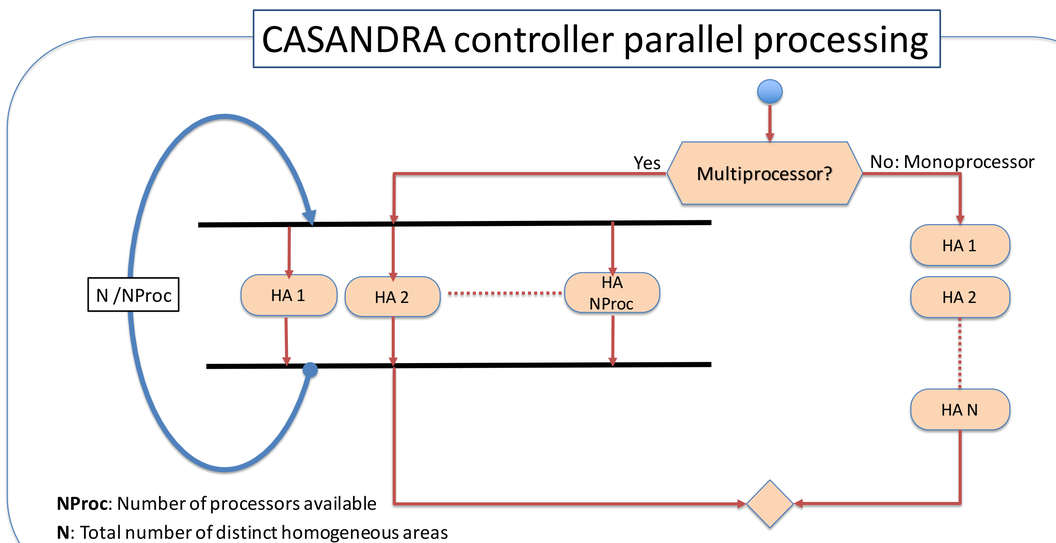


Homogeneous Area (HA) detailed parameters and execution:



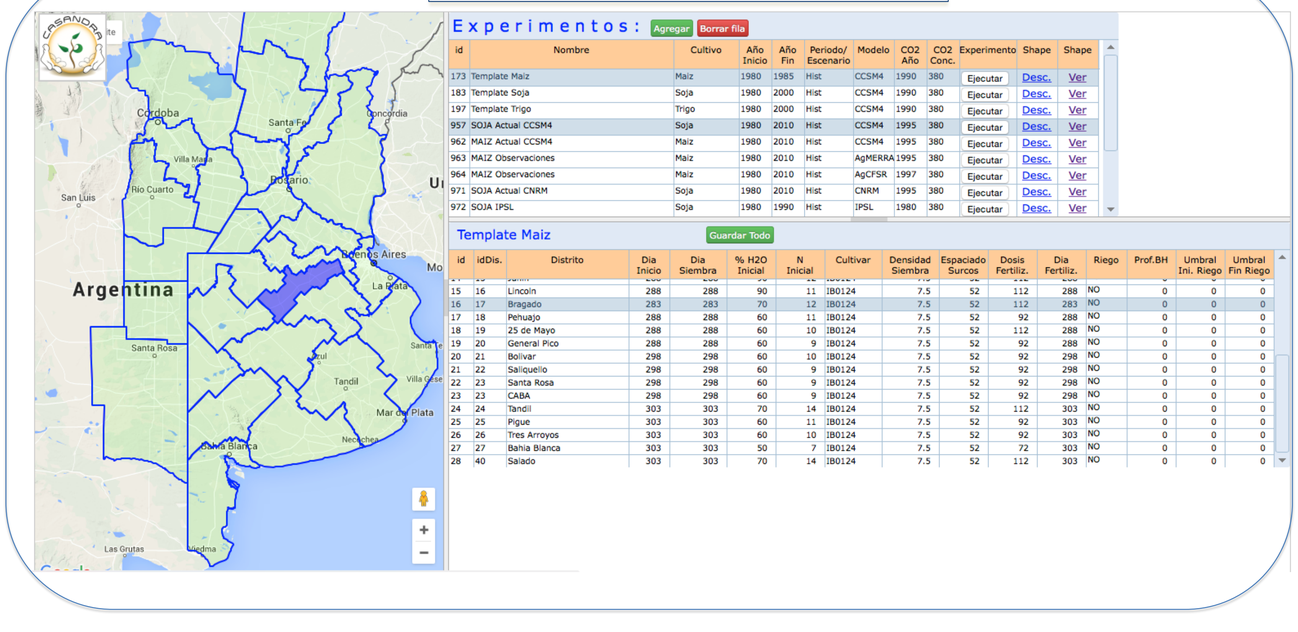
CASANDRA performs calculations incorporating the concept of **homogeneous area (HA)** as unit of calculation, which is simply the intersection of different layers of information as climate, soil, management/cultivar on interested regions. The platform uses open source technologies as (MySQL, R, php, JavaScript, Open Layers, Apache) and use algorithms of optimization and parallelization to perform the calculation fast if a multiprocessor machine is available or an HPC Cluster.

CASANDRA controller parallel processing



NProc: Number of processors available
N: Total number of distinct homogeneous areas
HA: Homogeneous area

Administration web interface



The platform was design to be easily used as well as to have the possibility to generate output information to be share with modern devices as smart-phones and tablets, using open source web mapping technologies (Open Layers) to show results. CASANDRA was design by the concept of "platform independent", "open source" and "cloud development" so it can be use on Windows, Linux, OSX, Android, etc.

The platform was used for the **"Third Communication of Climate Change in Argentina for Impact and Adaption in Agriculture".** Look for the poster "Climate impacts on crop yields in Central Argentina. Adaptation strategies" to view some results**.**

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