



An integrated interdisciplinary modelling system of climate change impacts on agriculture in support of adaptation planning: MOSAICC

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29 June, 2016

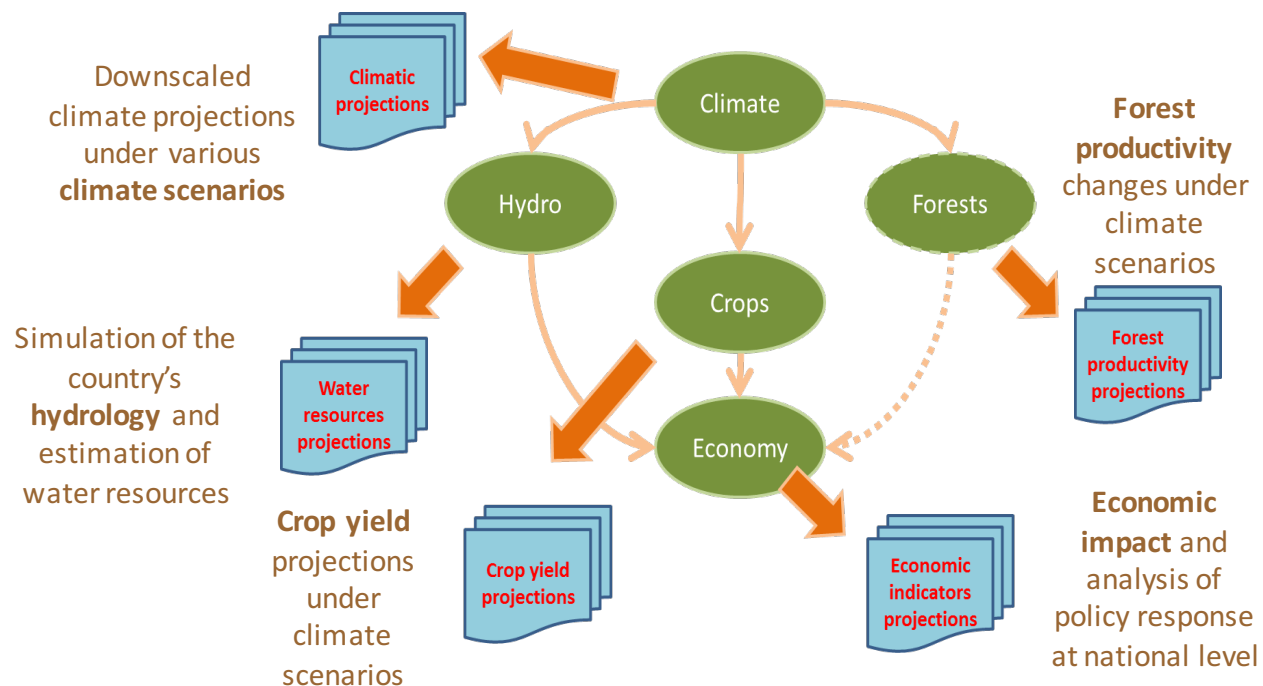
Montpellier, France



Objectives

- Support evidence-based climate change adaptation policies/programs/projects
- Facilitate inter-disciplinary research on potential impacts of climate change on agriculture
- Information and capacity gaps
- Simpler models
- Integrated
- Modelling System for Agricultural Impacts of Climate Change - MOSAICC

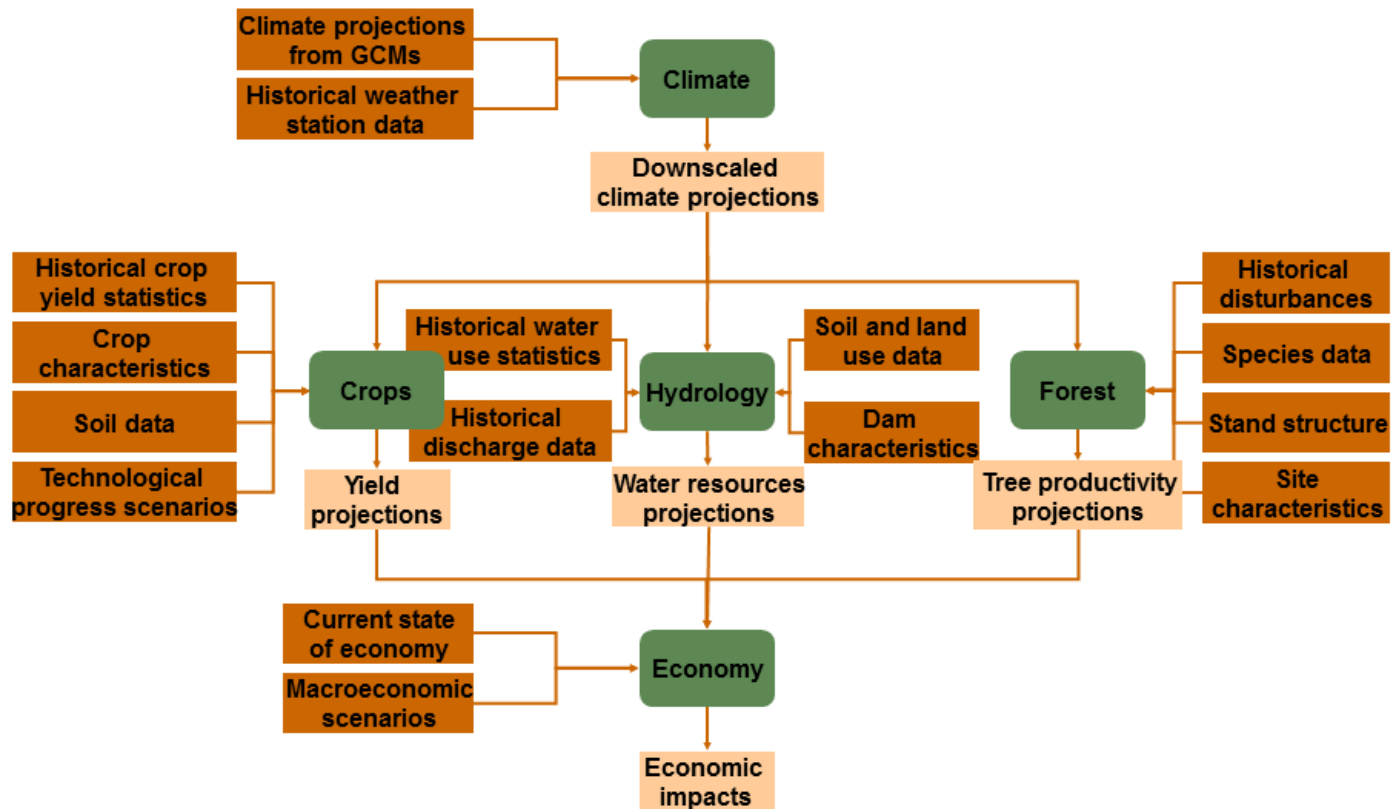
MOSAICC - Choice of models



- Top-down approach of CC impact assessment
- Robustness rather than sophistication (minimum input data required, simple)
- Flexibility, wide application, adaptable
- Free

MOSAICC- Integration

- Runs on a server, not desktop software
- Web interface



MOSAICC- Integration

- Central geospatial database that facilitates exchange of data between models
 - Hydrology – on small grids, monthly
 - Crop – at station or on grid or by province, 10-daily
 - Economics – by province, annual
- Other tools such as spatial interpolation
- Data/simulation tracking
- Modular - additional models? (livestock, fisheries/aquaculture, nutrition, etc)
- The system design encourages interdisciplinary collaboration

Application

- Primary intended users: researchers in developing countries
- Primary application: support medium- to long-term climate change adaptation planning by strengthening evidence-base
- Mainly national level with sub-national disaggregation
- Emphasis on capacity development

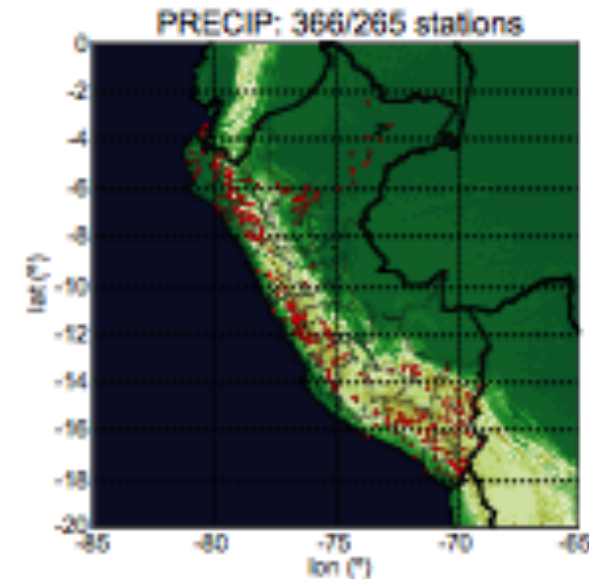
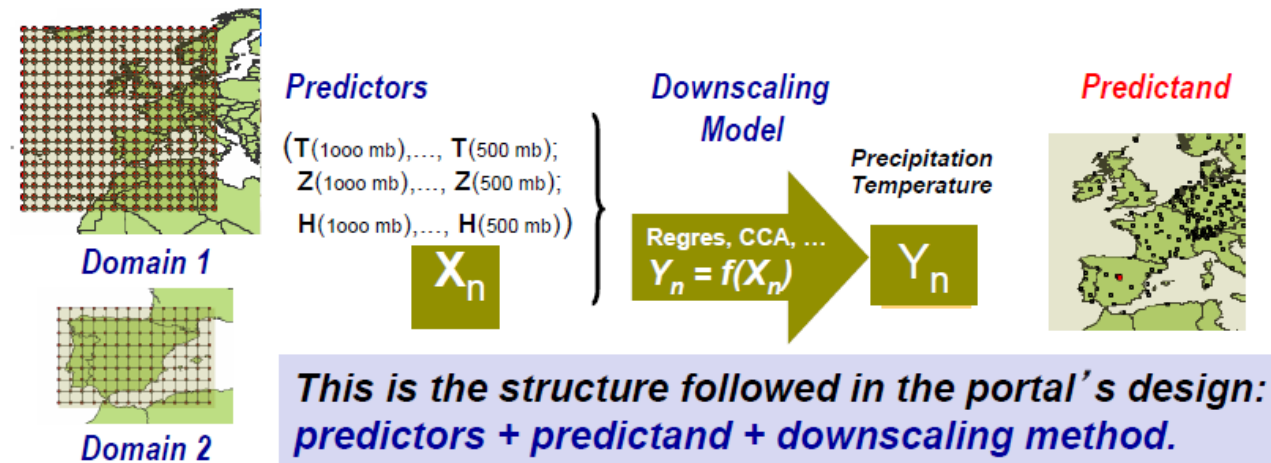


Typical country implementation

- Inter-disciplinary technical working group
- Define study objectives, study design (stakeholders engagement)
- Data sharing
- Extensive training programs for each MOSAICC module
- Each group of trained local experts performs simulations, using country's own data
- Analysis, interpretation, visualization and communication of the results



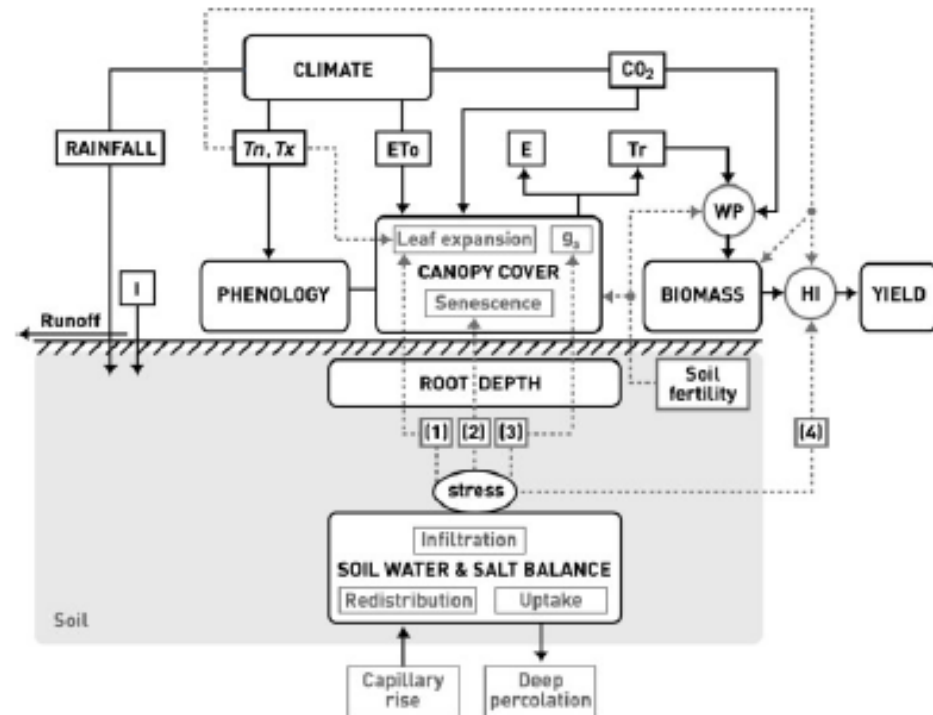
Statistical climate downscaling



- Statistical downscaling to station level
- Daily
- Santander Meteorology group, University of Cantabria

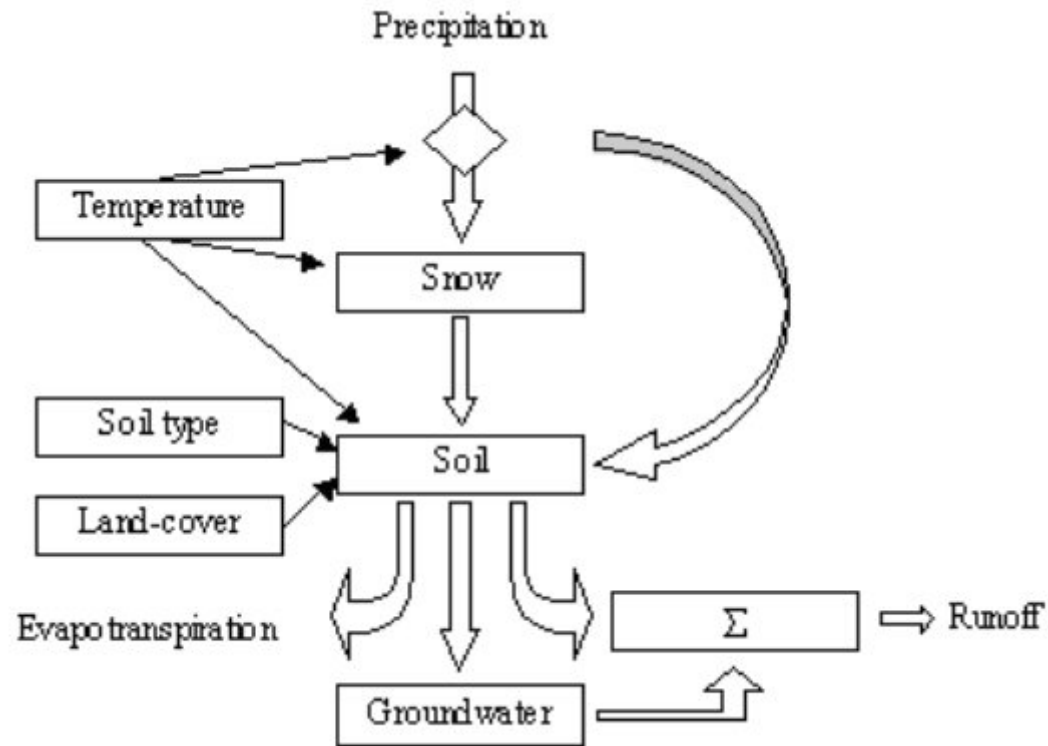
AQUACROP

- FAO crop water productivity model to simulate yield response to water
- Focuses on water
- Uses canopy cover instead of leaf area index
- Balances simplicity, accuracy and robustness
- Planning tool
- Calibrated for cotton, maize, potato, tomato, wheat, rice, sugar beet, quinoa, soybean etc.



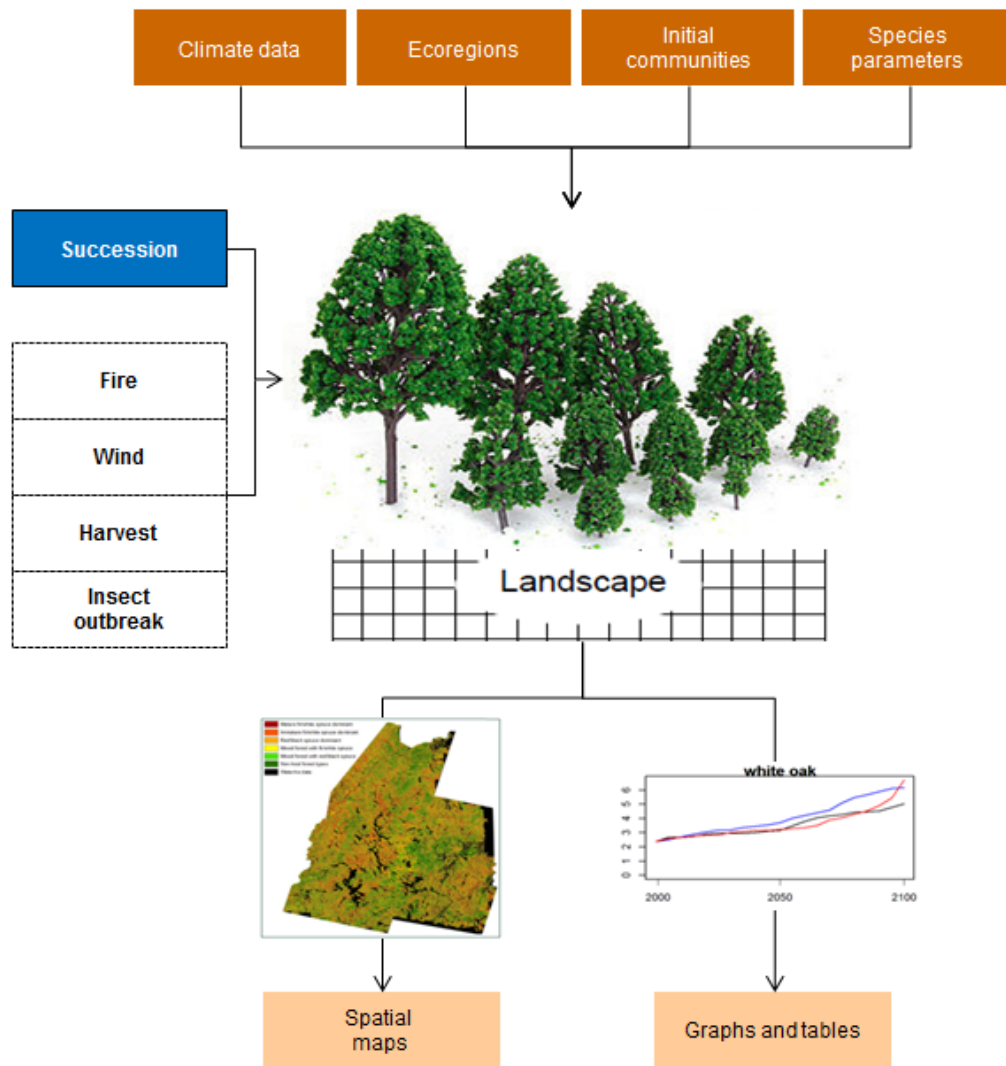
STREAM – hydrological model

- Empirical model of surface hydrology --- from rainfall, temperature, evapotranspiration, to the simulation of river runoff and water availability in large river basins.



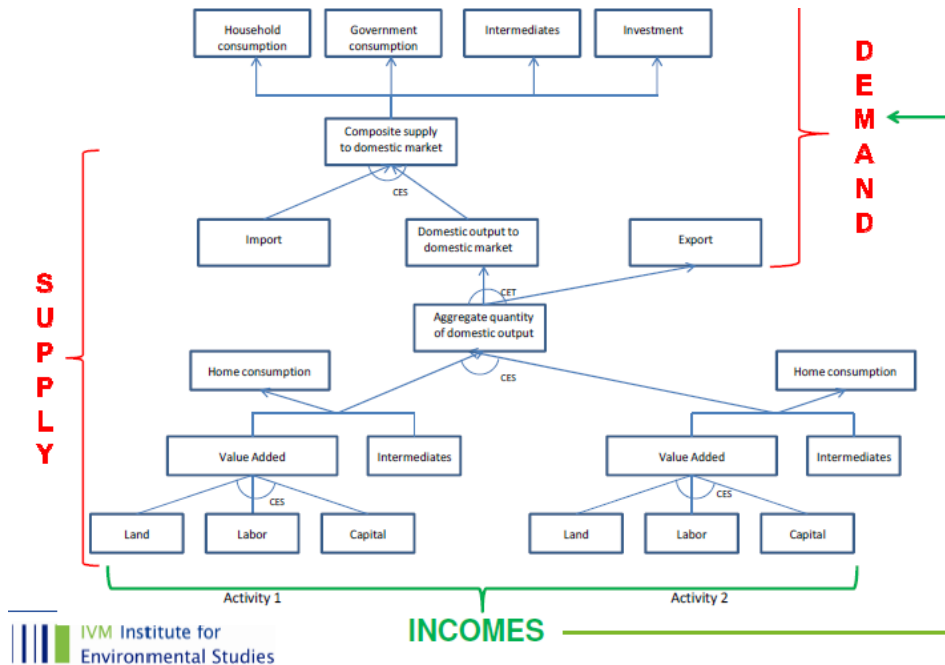
LANDIS-II - forest model

- Forest landscape simulation model. It simulates how ecological processes including succession, seed dispersal, disturbances, and climate change affect a forested landscape over time.
- Developed by Portland State University



DCGE

- Dynamic Computable General Equilibrium model, developed by IVM, Free University of Amsterdam
- Model the future evolution of the national economy of a country and the changes induced by variations of crop yields under climate change scenarios.
- Generic, adaptable to local conditions (production factors, activities, commodities, consumer types etc) according to the data availability
- Requires the assemblage of a social accounting matrix (SAM)



Conclusions

- The integrated system design with different models
 - allows a collaborative interdisciplinary research
 - brings together biophysical, social and economic researchers in a single community
- Implementation strategy emphasizes stakeholder engagement, with strong focus in capacity development
- MOSAICC can be used to strengthen evidence-base about potential climate impacts, and feeds medium to long term adaptation planning
- AgMIP, CGRA?
- Work with us – additional module? New country?



Thank you

- Info:
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 - www.fao.org/climatechange/mosaicc
- Partners



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Servizi Informatici



Numerical Ecology of
Aquatic Systems



FAO-MOSAICC is developed in the framework of the EU/FAO Programme on “Improved Global Governance for Hunger Reduction”