



Photo credits: Yann le Polain de Waroux

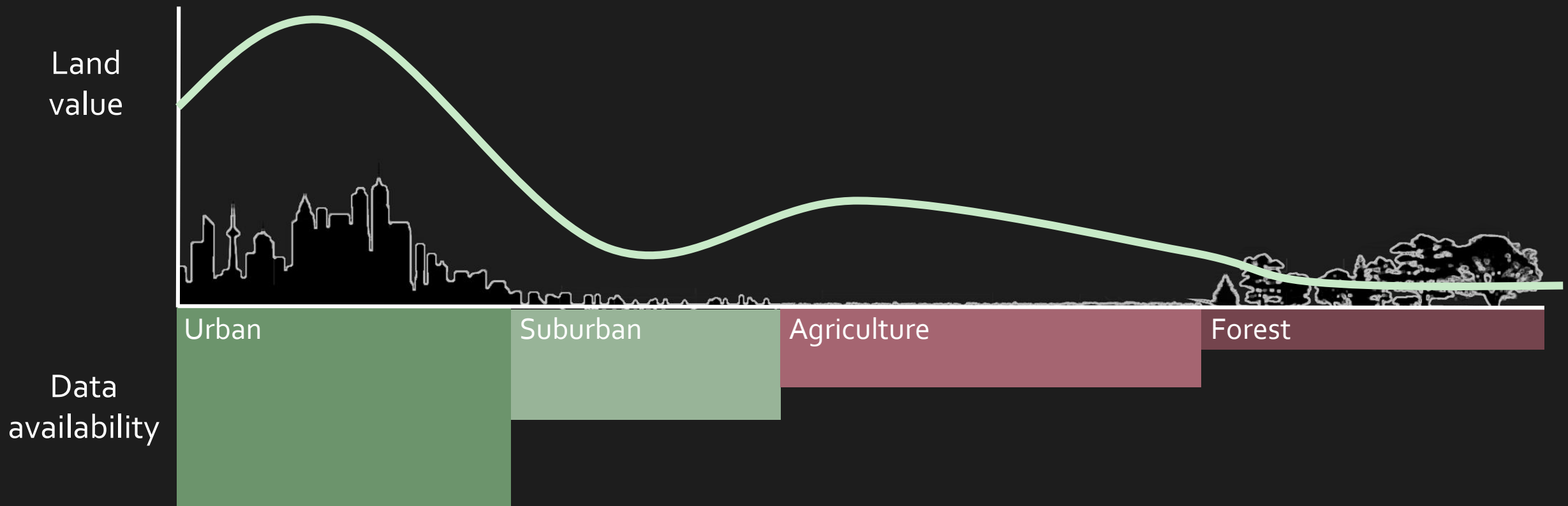
Mapping property values to understand land-use change in Paraguay and Uruguay

Robert Heilmayr, Jordan Graesser,
Atahualpa Ayala, Yann le Polain de Waroux

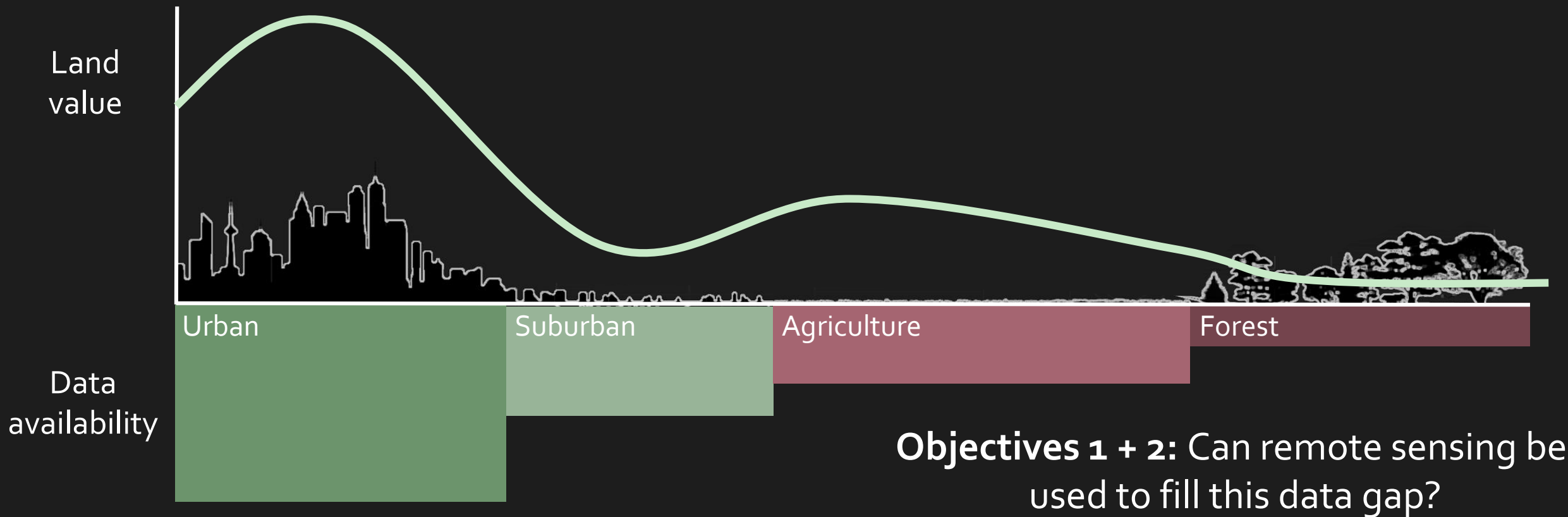
How much do people value the environment?

Where will new frontiers of land use change emerge?

What is the effectiveness, cost and equity impact of conservation policy?



Objective 3:
What is the effectiveness,
cost and equity impact of
conservation policy?



Objective 1: Field-level agricultural practices

Data

Field



Landsat

Sentinel-2

Cubes



Processing

Time series

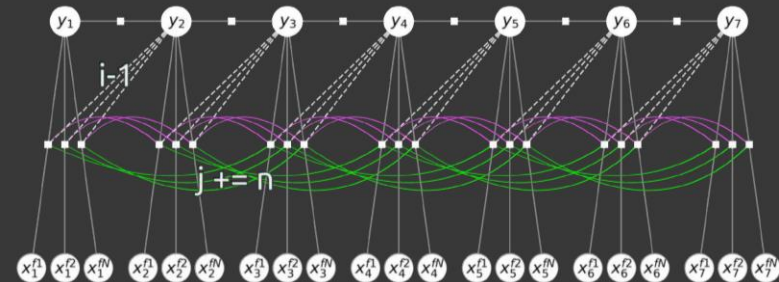


Field parcels

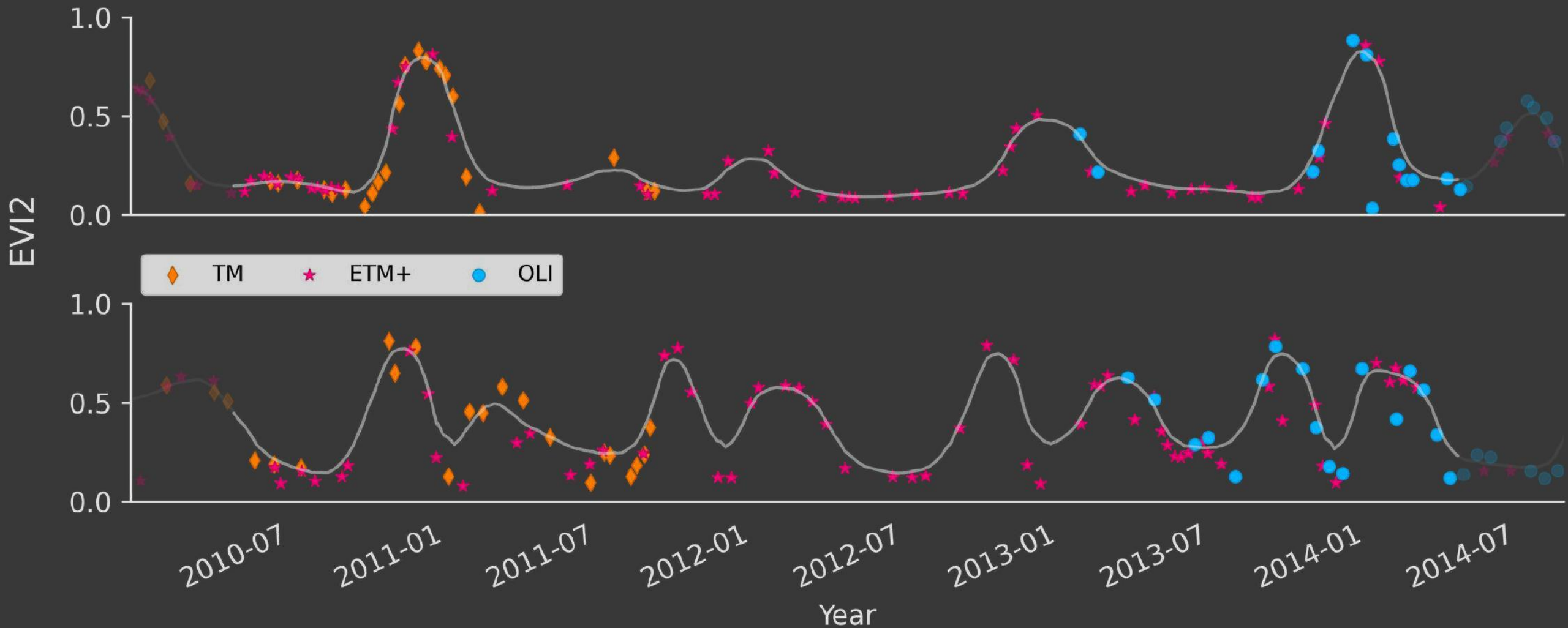


Classification

Land cover
Crop species
Productivity
Configuration



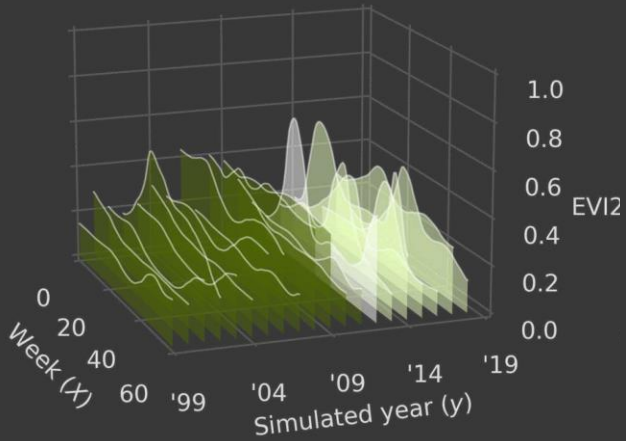
Dynamic temporal smoothing



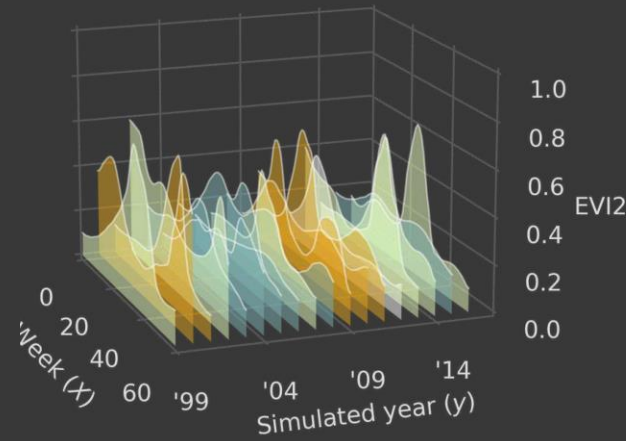
Reference: Graesser, Stanimirova, and Friedl (in prep)

Classification using Conditional Random Fields

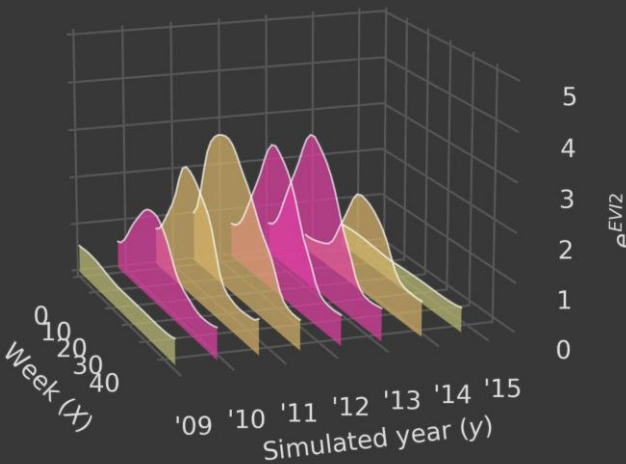
tree herbaceous



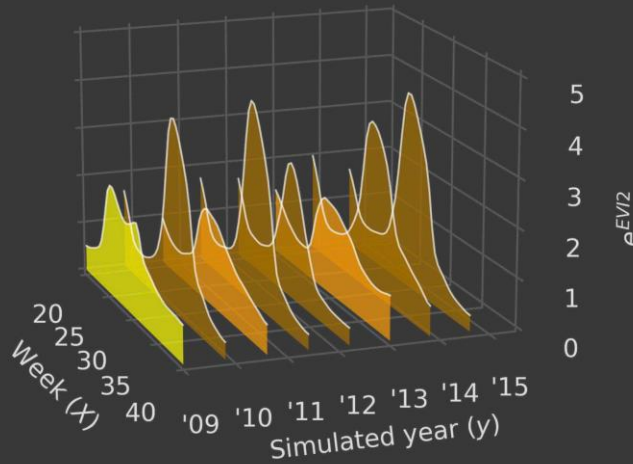
herbaceous crop wetland



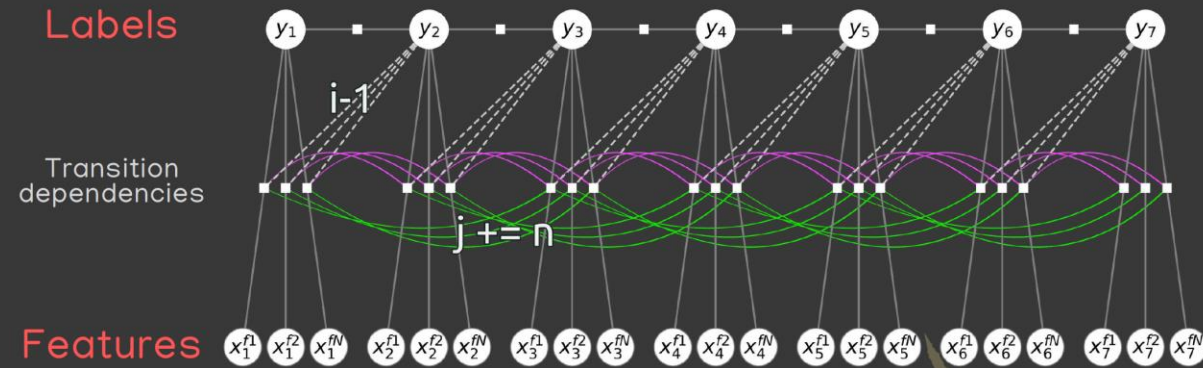
fallow barley spring wheat



sunflower winter wheat sorghum



Labels

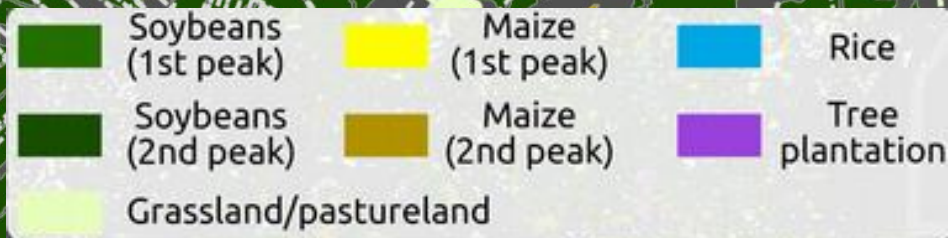


Features

Reference: Graesser, Stanimirova, Friedl, Copati, Volante, Veron, Banchemo, and Elena (in prep)

Field-level agricultural practices







Property boundaries

Field boundaries

Objective 2: Mapping values

How does this property's agricultural practices relate to its value?



Objective 2: Mapping values



Objective 2: Mapping values

Biophysical features

- Geographic location
- Soil type
- Climate

Features from remote sensing

- Crop types and history
- Field sizes and configuration
- Regional yield gaps



Property value labels

- Central Bank of Paraguay
- Servicio Nacional de Catastro, Paraguay
- General Directorate of Records, Uruguay
- REMAX Paraguay and Uruguay



Objective 3: Costs of conservation

What cost does owner bear due
to conservation policies?



Objective 3: Costs of conservation

Price of forested
land (\$/ha)

Regression discontinuity

Border



Distance from
border



Investigators: Robert Heilmayr, Jordan Graesser

Collaborators: Yann le Polain de Waroux, Atahualpa Ayala, Rubèn Eduardo Maidana Moreno, Paula Durruty

