





GEOBENE 

Avoided Deforestation Map
Avoided deforestation (accumulated) between 2000 and 2100. The biomass not deforested if a carbon price of 12\$/tC is paid and that would be deforested if there was no carbon price at all (MtC/Grid). All data based on B2 scenario. Grid cell 0.5 degree resolution.

0 (light green) - 33 (dark green) MtC/Grid

User Perspective

View from Integrated Assessment Modeling

GEOBENE 

Deforested Biomass Map
Deforested biomass between 2000 and 2100. The biomass deforested although a carbon price of 12\$/tC is paid (MtC/Grid). All data based on B2 scenario. Grid cell 0.5 degree resolution.

0 (orange) - 37 (red) MtC/Grid

P. Havlik, G. Kindermann, S. Leduc, M. Lexer, M. Obersteiner,
U. Schneider, E. Schmid
& ca. 30 direct collaborators

Image NASA
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Map data © 2007 DMaps/El Mercurio
Image © 2007 TerraMetrics
Streaming ||||| 100%

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Users – Biophysical/Economic Modelling as Intermediary between EO and Decision Making

- Integrated Assessment Community
 - IPCC
 - Global Ecosystem/Agriculture/Energy Assessment
- Policy Support
 - European Commission
 - Worldbank
 - DK, UK Government
 - WWF, Conservation International
- Local Decision Making in Forestry

Show none

Global Land Cover Maps:

- Show MODIS
- Show GlobCover
- Show GLC-2000

Disagreement Maps:

- Show Combined Disagreement Map

Cropland Disagreement Maps:

- Show GlobCover - GLC-2000
- Show GlobCover - MODIS
- Show MODIS - GLC-2000

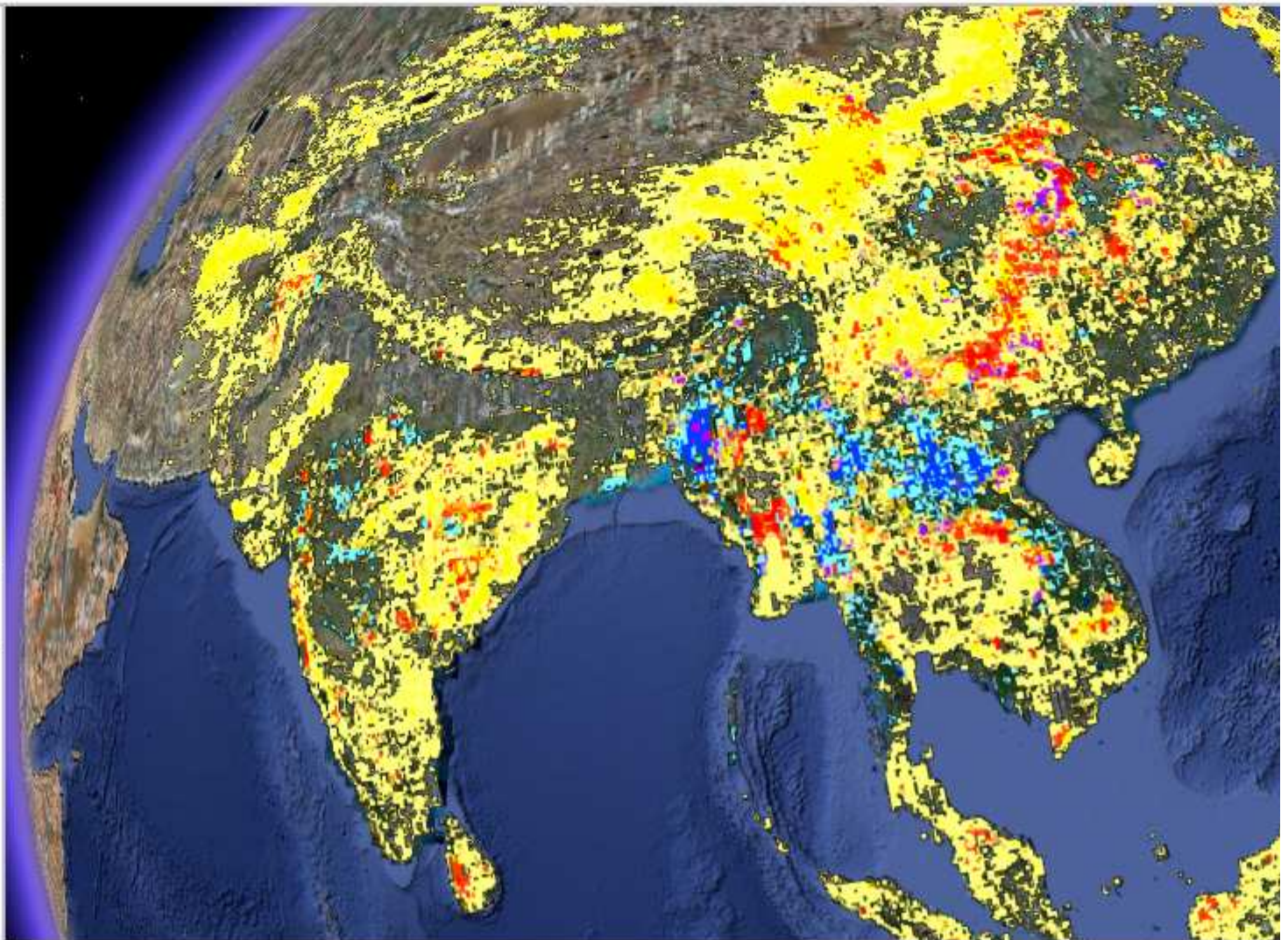
Forest Disagreement Maps:

- Show GlobCover - GLC-2000
- Show GlobCover - MODIS
- Show MODIS - GLC-2000

- Load Basedata
- Load Panoramic
- Load Confluence
- Load Pictures

Legend to show:

- cropland disagreement
- high cropland disagreement
- forest disagreement
- high forest disagreement
- forest and cropl. disagreem.
- forest and cropl. (high) disag.
- forest (high) and cropl. disag.
- high forest and cropl. disag.



Show none

Global Land Cover Maps:

- Show MODIS
- Show GlobCover
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Disagreement Maps:

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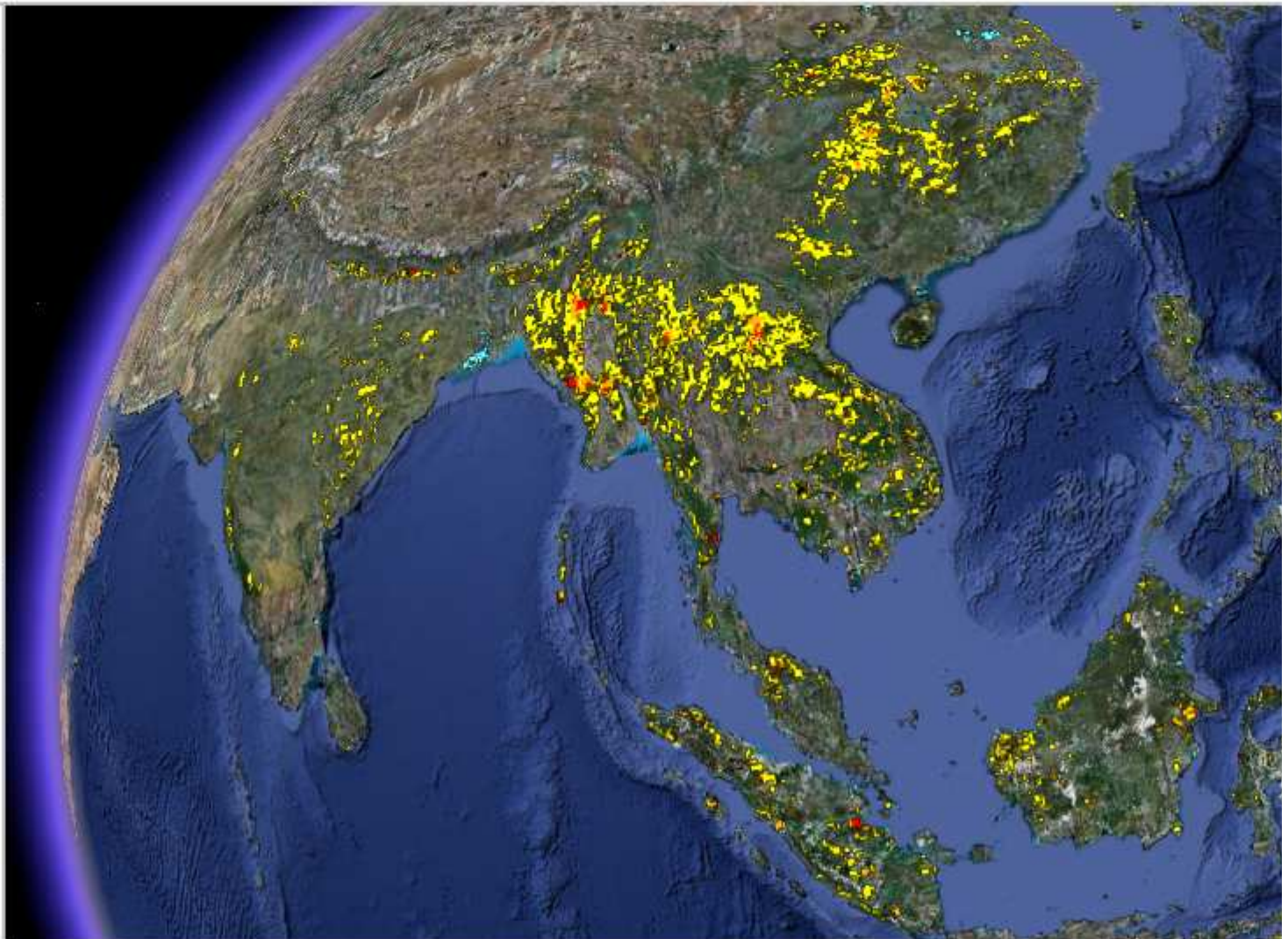
Forest Disagreement Maps:

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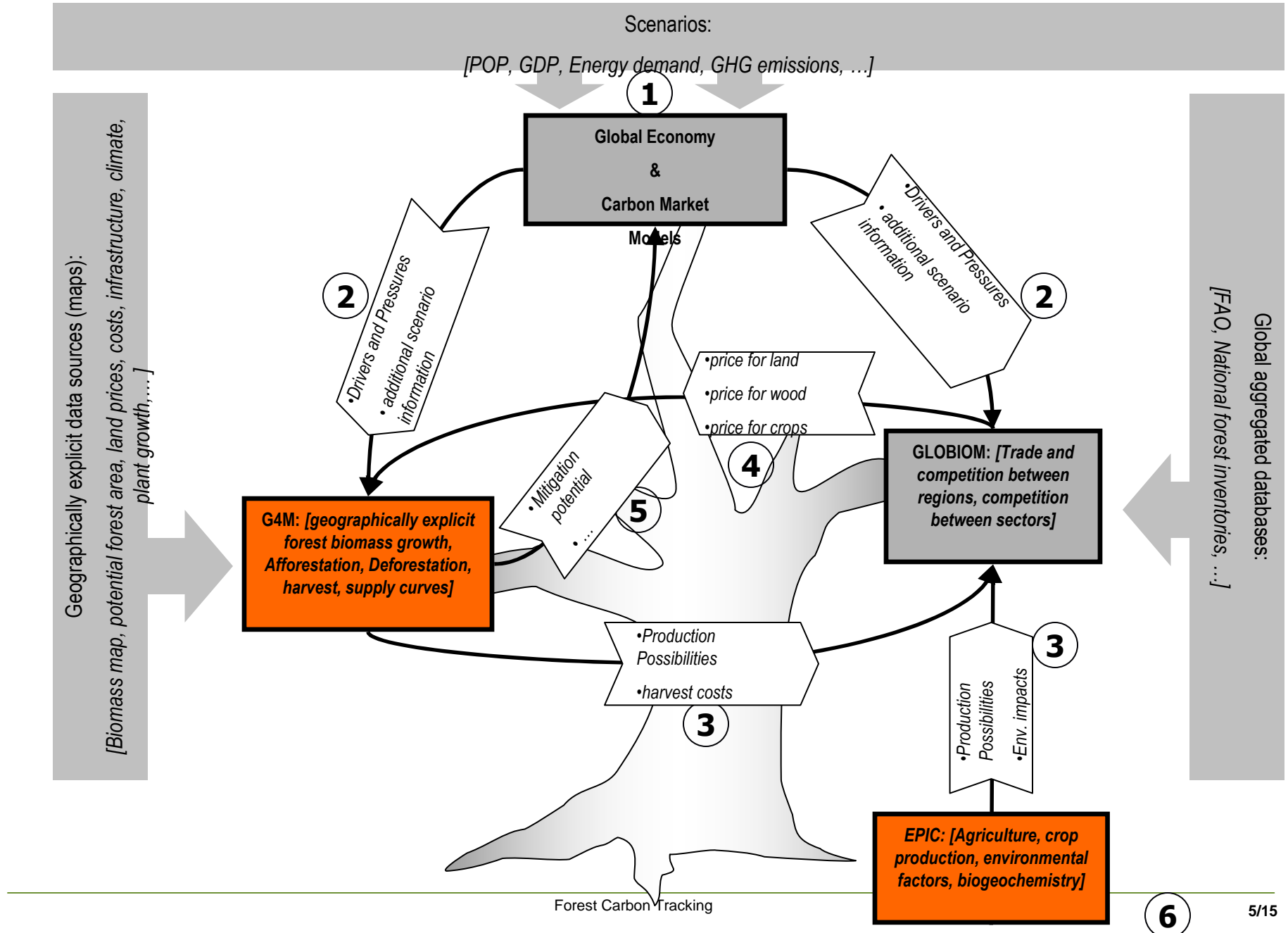
- Load Basedata
- Load Panoramic
- Load Confluence
- Load Pictures

Legend to show:

- 40 - 60 % more forest in GlobCover
- 20 - 40
- 10 - 20
- 5 - 10
-
- 5 - 10 % more forest in MODIS
- 10 - 20
- 20 - 30
- 30 - 40



The IIASA Model Tree to Assess Avoided Deforestation Costs

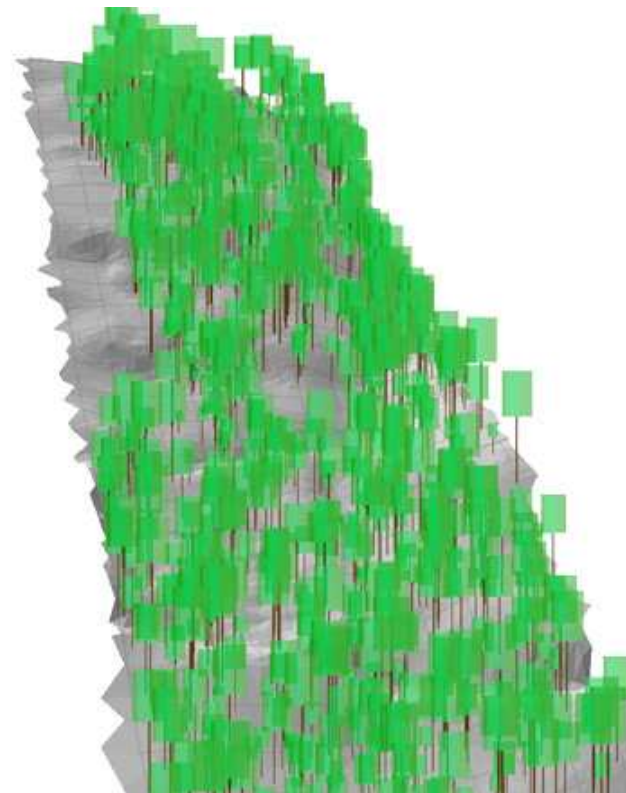


Model components

PICUS v1.41 simulation software

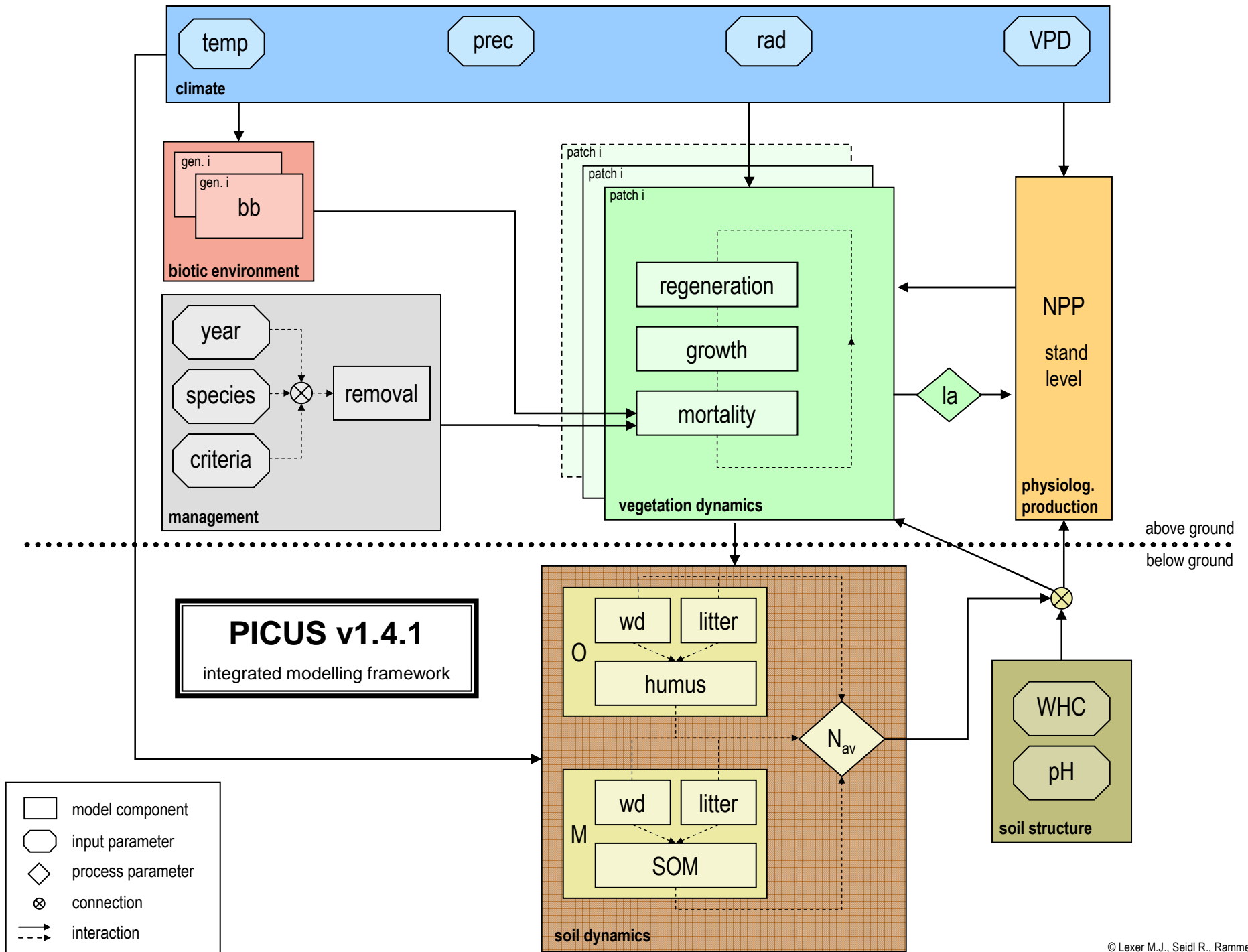
Rockfall model

- single 3D rockfall trajectories
- stochastic & deterministic algorithms
- rolling / jumping
- energy loss from:
 - rolling friction
 - ground impacts (rebounds)
 - tree hits

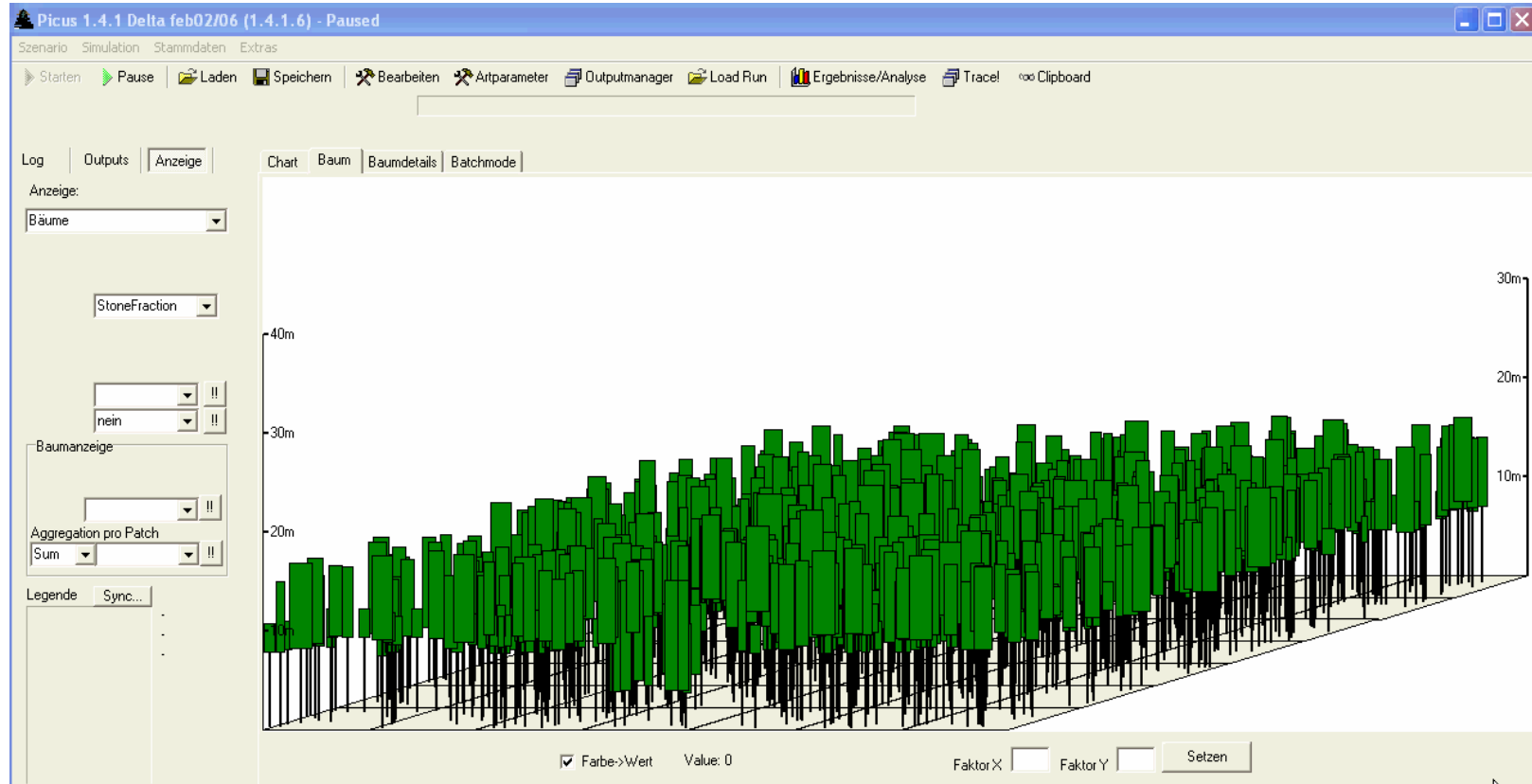


Rockfall model

Woltjer et al (2007)



20 years of forest development demonstration



time series of a bark beetle infestation in a Norway spruce

EPIC simulates many Processes:

Weather: simulated or actual

Hydrology: evapotranspiration, runoff, percolation...

Erosion: wind and water, 7 erosion equations

Carbon sequestration: plant residue, leaching, sediment,...

Crop growth: NPK uptake, stresses, yields, N-fixation,...

Fertilization: application, runoff, leaching, denitrification, volatilization, nitrification,...

Tillage: mixing, harvest efficiencies,...

Irrigation and furrow diking,...

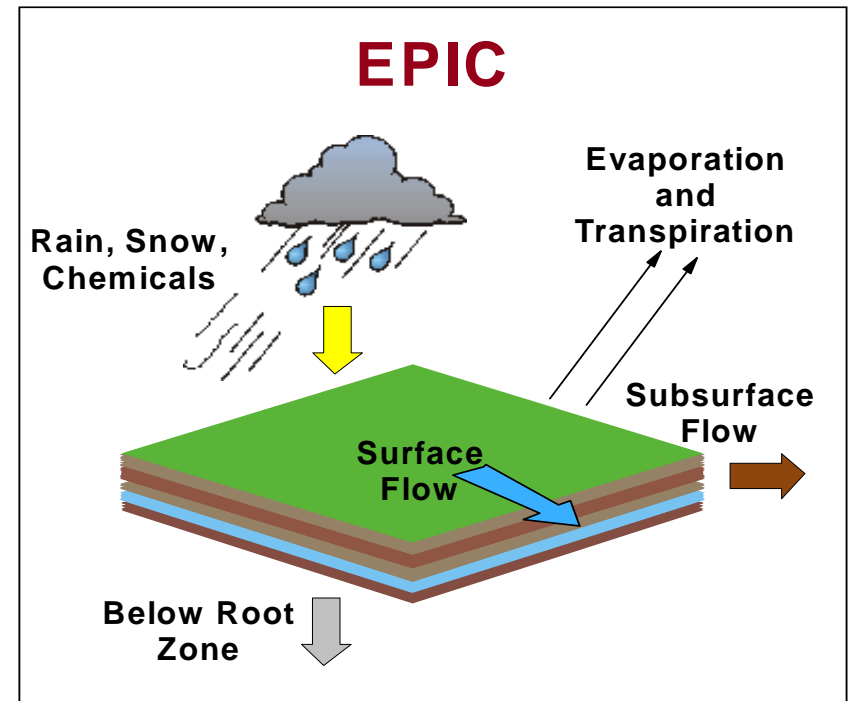
Drainage: depth,...

Pesticide: application, movement, degradation,...

Grazing: trampling, efficiency,...

Manure application and transport,...

Crop rotations: inter-cropping, weed competition, annual and perennial crops, trees



on a daily time step

Google Earth

File Edit View Tools Add Help

Search

Fly To Find Businesses Directions

e.g., 94043

Places

- Google Earth Community
- Points of Interest Layers
- 3D Buildings Layer
- Touring World Places
- Signposting
- default
- Temporary Places
- Crop Atlas of the World
 - IFPRI Atlas of Crop Distribution Globally
 - Binana and Plantain
 - Beans
 - Cassava
 - Coffee
 - oil1
 - oil2
 - opul1
 - Potato
 - Rice
 - Soybean
 - Sweet Potato
 - Sugar Beet
 - Sugar Cane
 - Wheat
 - CIAT Logo
 - IFPRI Logo

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Image © 2007 TerraMetrics

IFPRI

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Layers

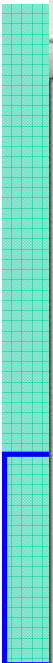
Pointer: 18°58'56.30" N 57°52'17.32" E Streaming 100% Eye alt: 5223.85 mi

start

Trbox - Microsoft Out... RE: Chapter 3 of see... D:\Docs\Presentation... Google Earth

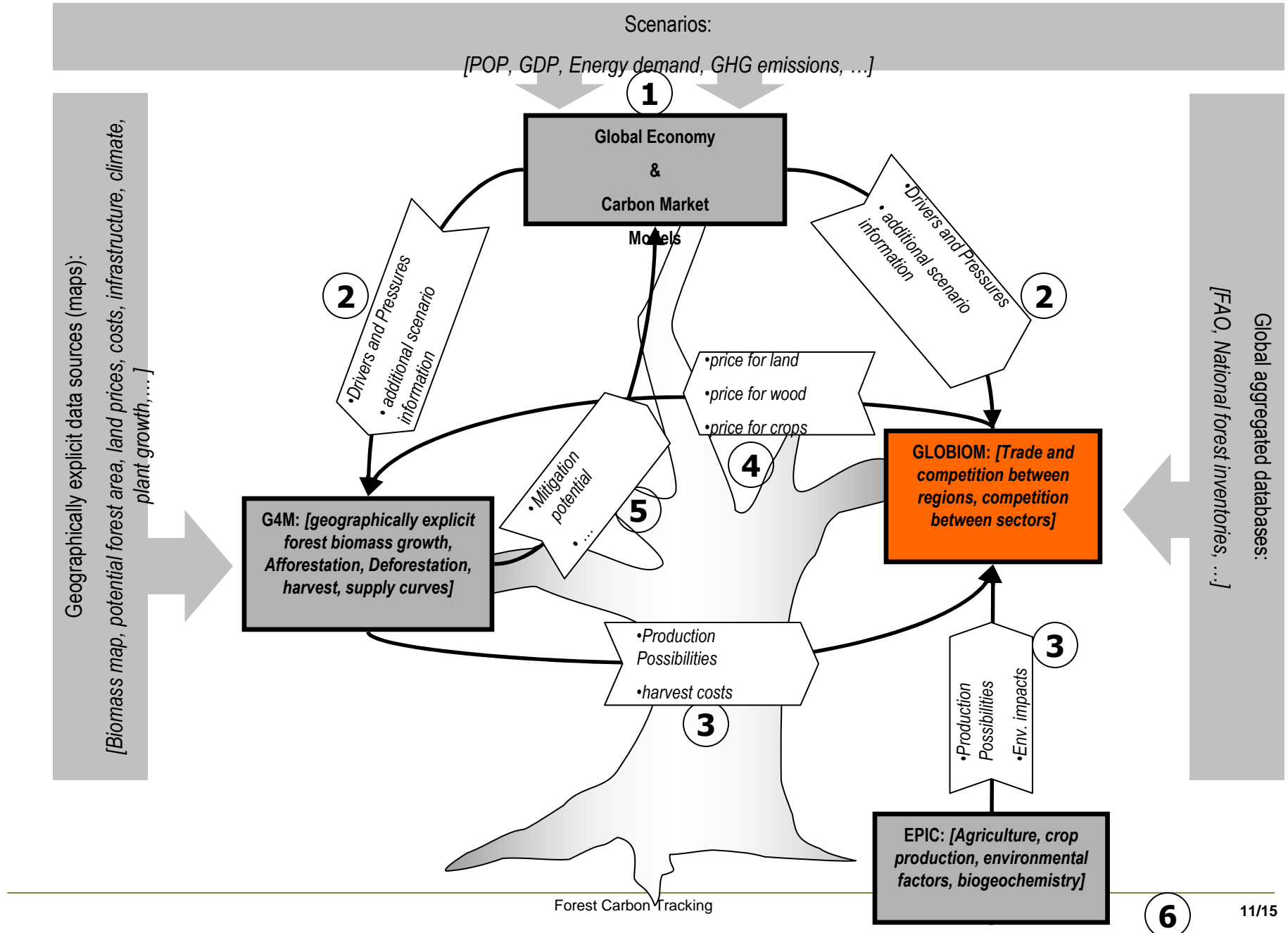
EN 10:43 AM

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The IIASA Model Tree to Assess Avoided Deforestation Costs



INTEGRATED LAND MODEL: GLOBIOM

3 land based sectors:

Forestry: traditional forests for sawnwood, and pulp and paper production

Agriculture: major agricultural crops

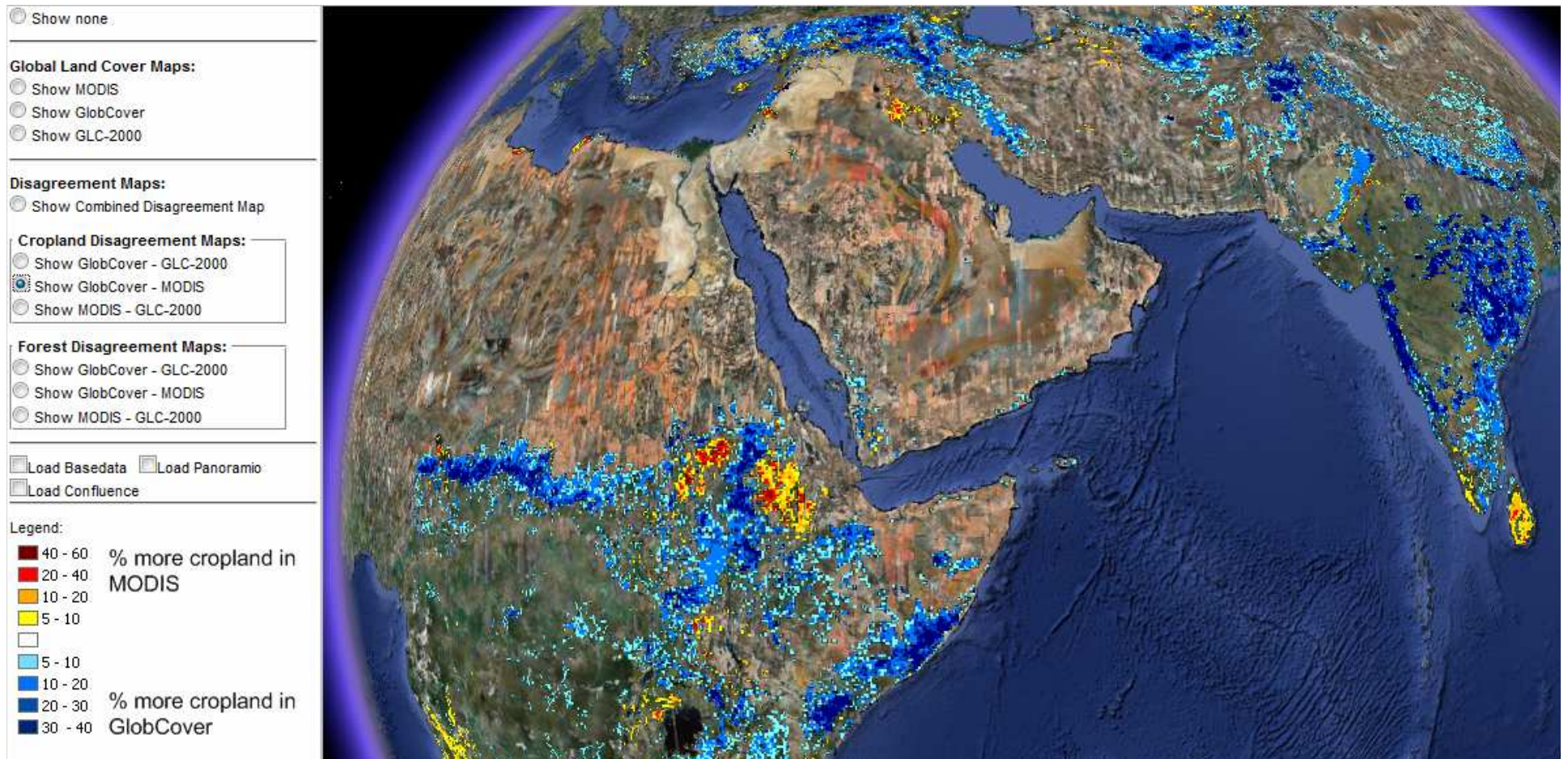
Bioenergy: conventional crops and dedicated forest plantations

Optimization Model (FASOM structure)

Maximization of the Social Welfare (PS + CS)

Partial equilibrium model: endogenous prices

Large Land Cover uncertainties



Numerical analysis - Baseline

Simulation horizon: 2000–2030

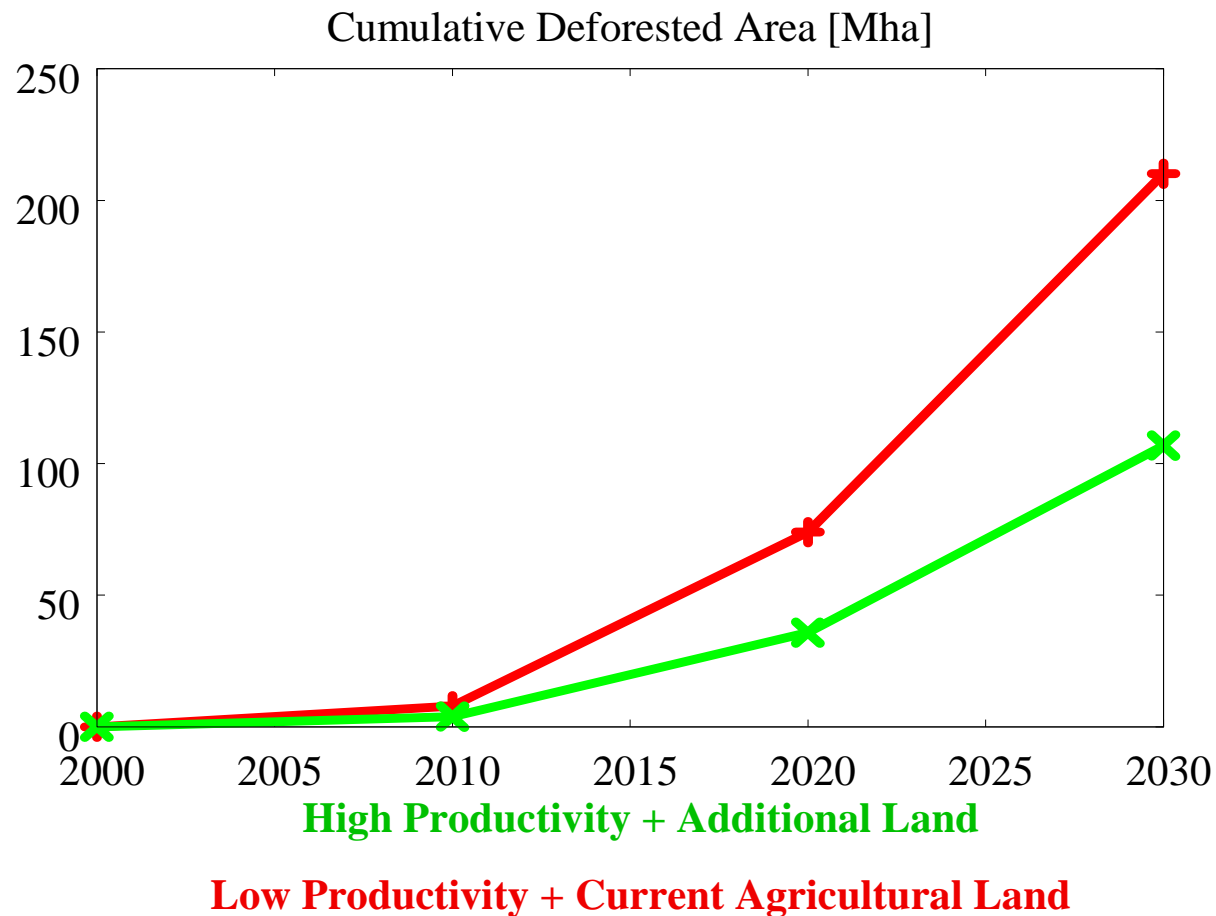
Main drivers: Population
Diets
Bio-energy demand
Infrastructure
(GDP, technological change,...)

2 scenarios with respect to forest plantations:

High Productivity + Additional Land

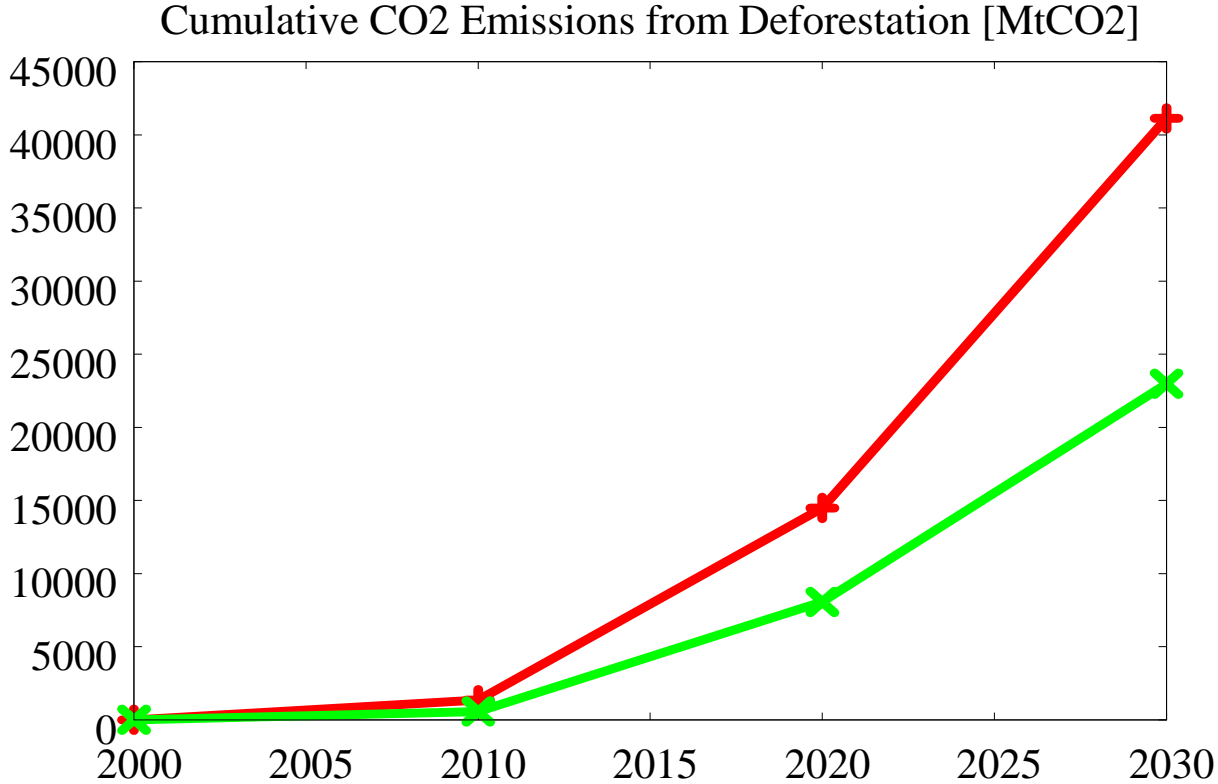
Low Productivity + Current Agricultural Land

Numerical analysis - Baseline: Forests



Demand for ag. products and bio-energy will put pressure on deforestation...

Numerical analysis - Baseline: Forests

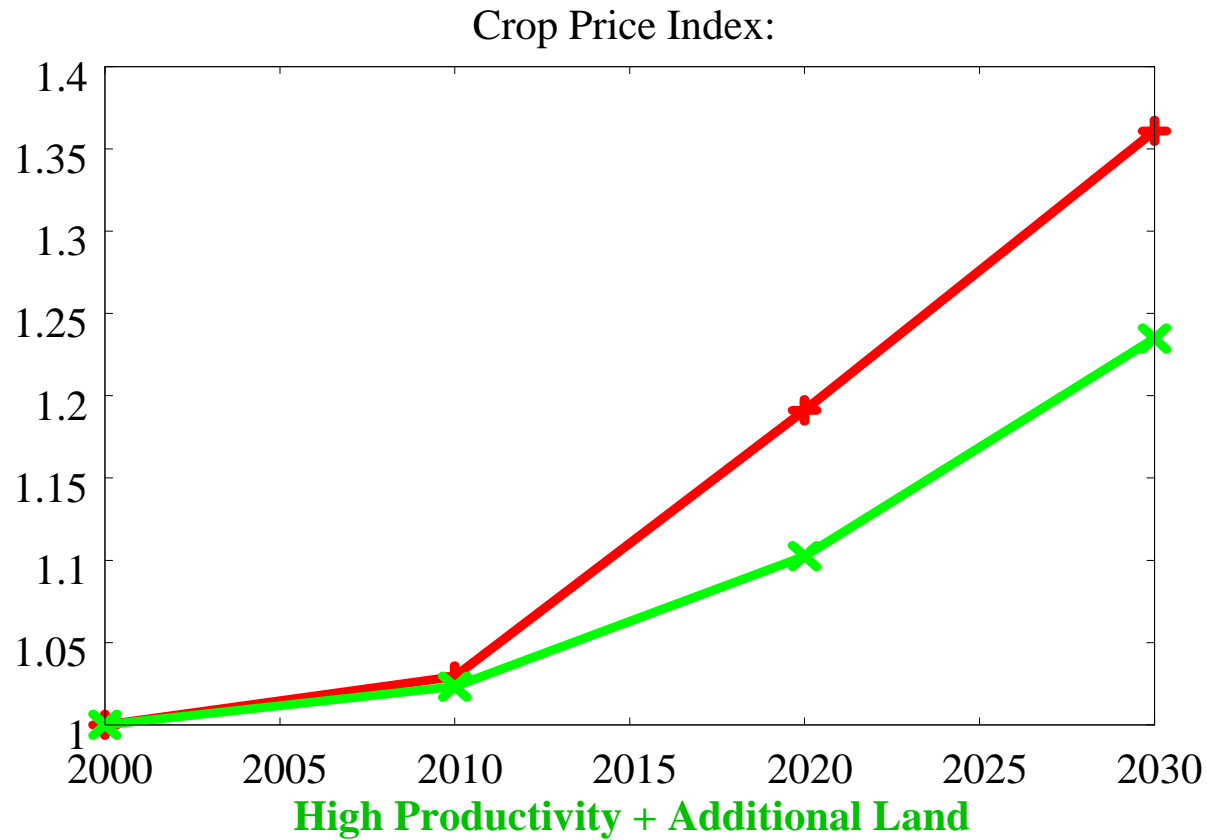


High Productivity + Additional Land

Low Productivity + Current Agricultural Land

... and thus on CO2 emissions.

III. Numerical analysis - Baseline: Food

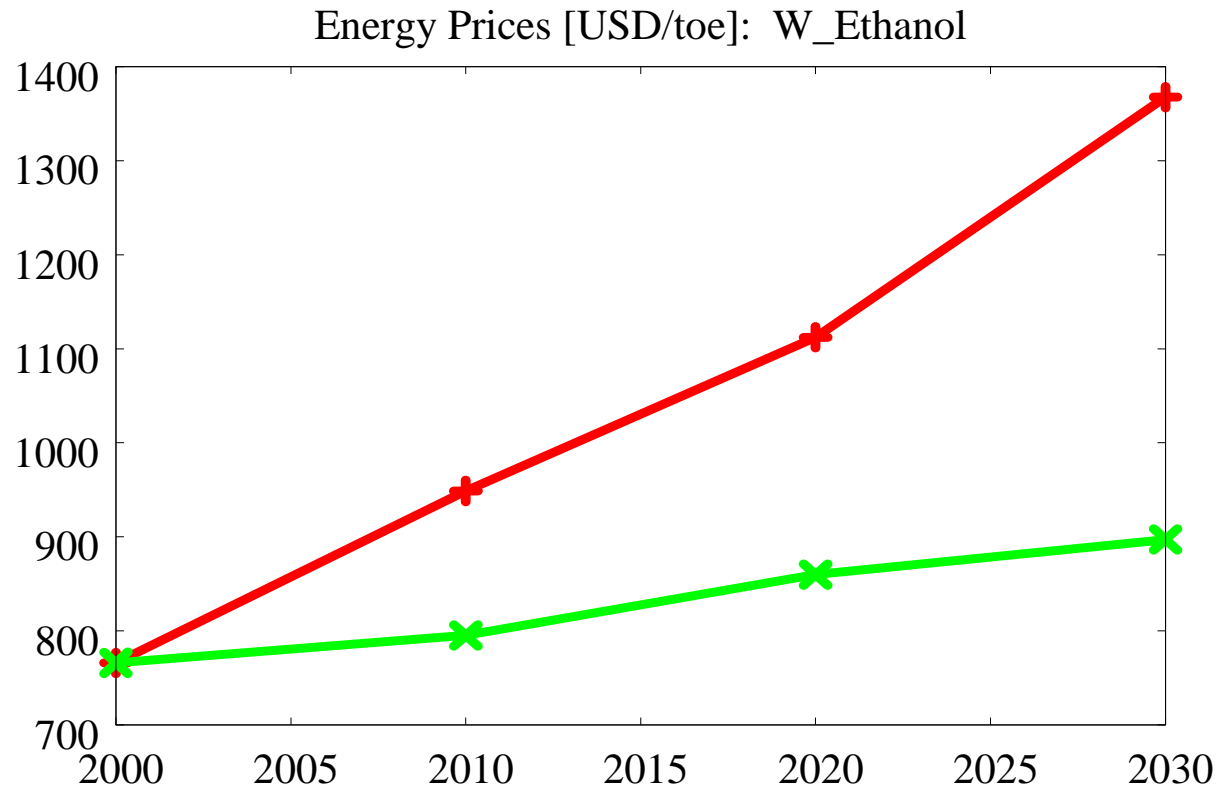


Low Productivity + Current Agricultural Land

Moderate increase in crop prices if production systems adjust!

17

III. Numerical analysis - Baseline: Energy



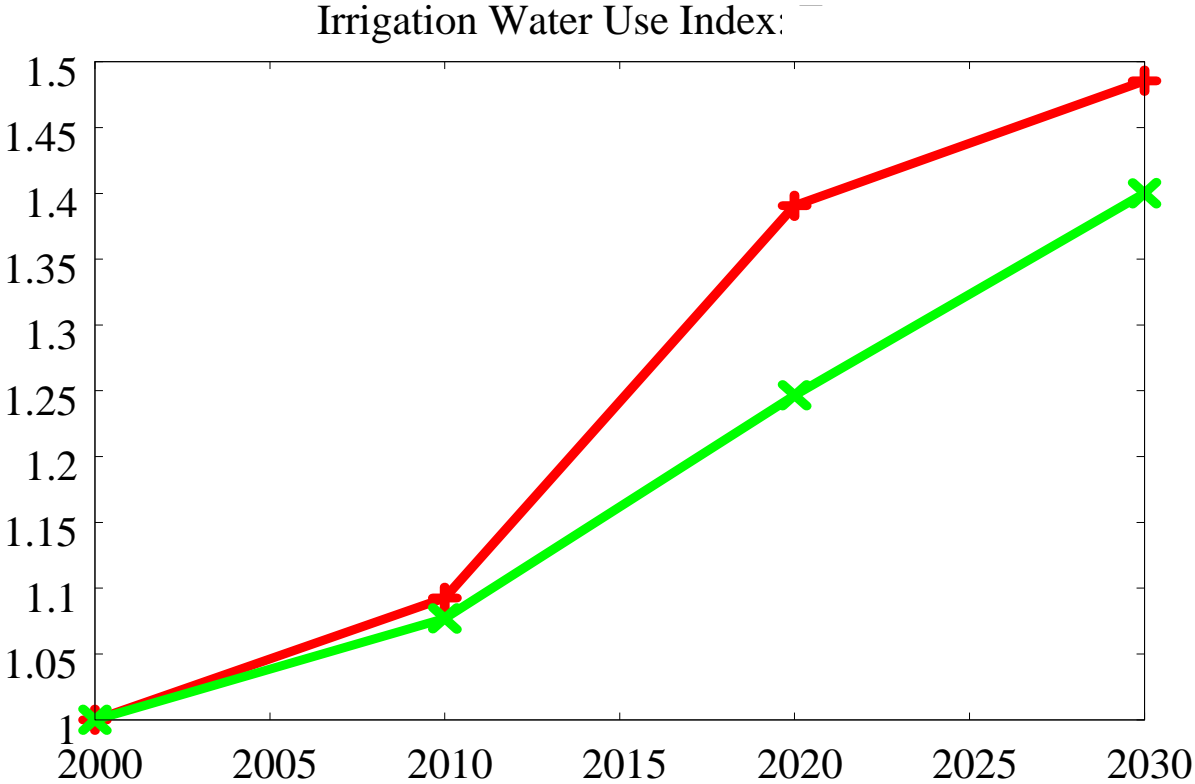
High Productivity + Additional Land

Low Productivity + Current Agricultural Land

Availability of currently not used land important for development of biofuels

18

III. Numerical analysis - Baseline: Intensity

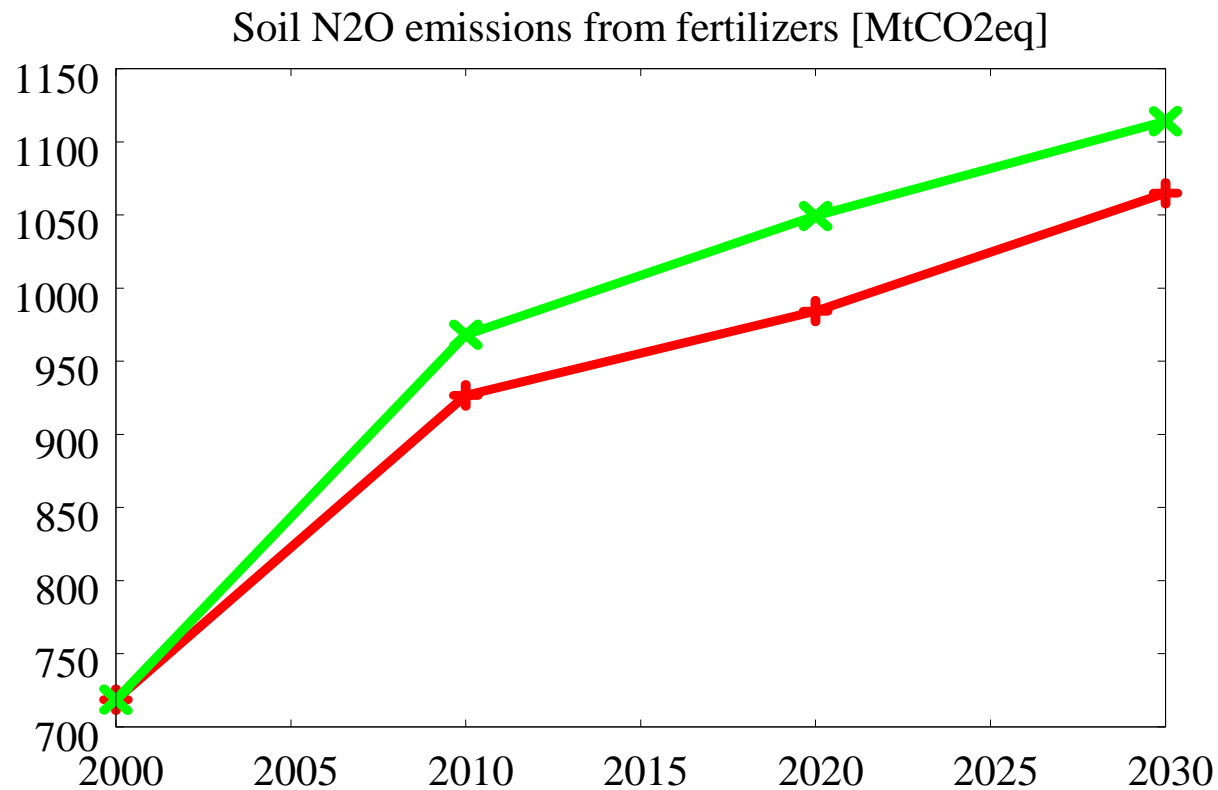


High Productivity + Additional Land

Low Productivity + Current Agricultural Land

Is intensification possible?

III. Numerical analysis - Baseline: Soil N2O



High Productivity + Additional Land

Low Productivity + Current Agricultural Land

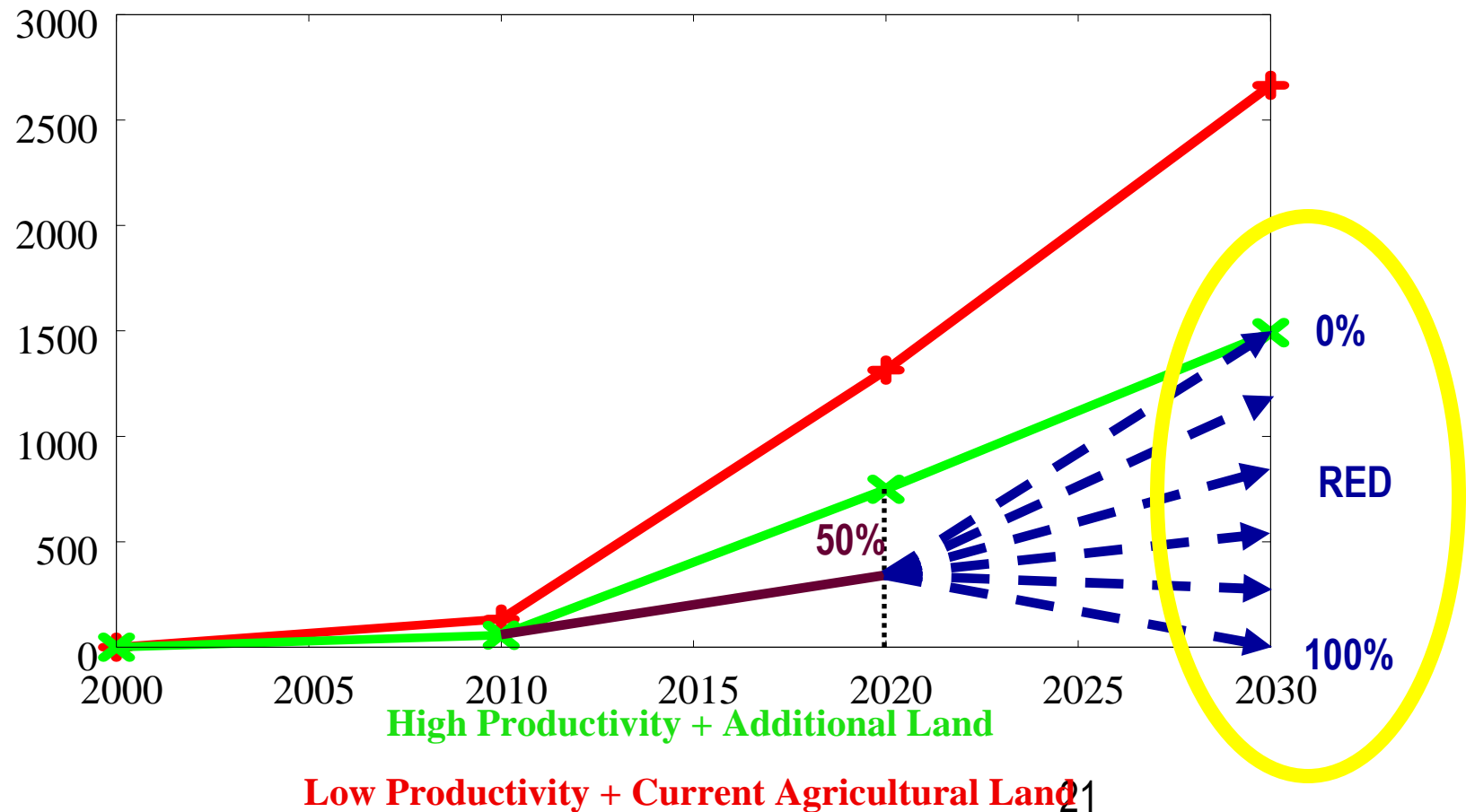
Increased production → soil N₂O emissions → but more with more land !

IV. Numerical analysis - RED

SCENARIO: 2030 emissions reduction compared to High Productivity +

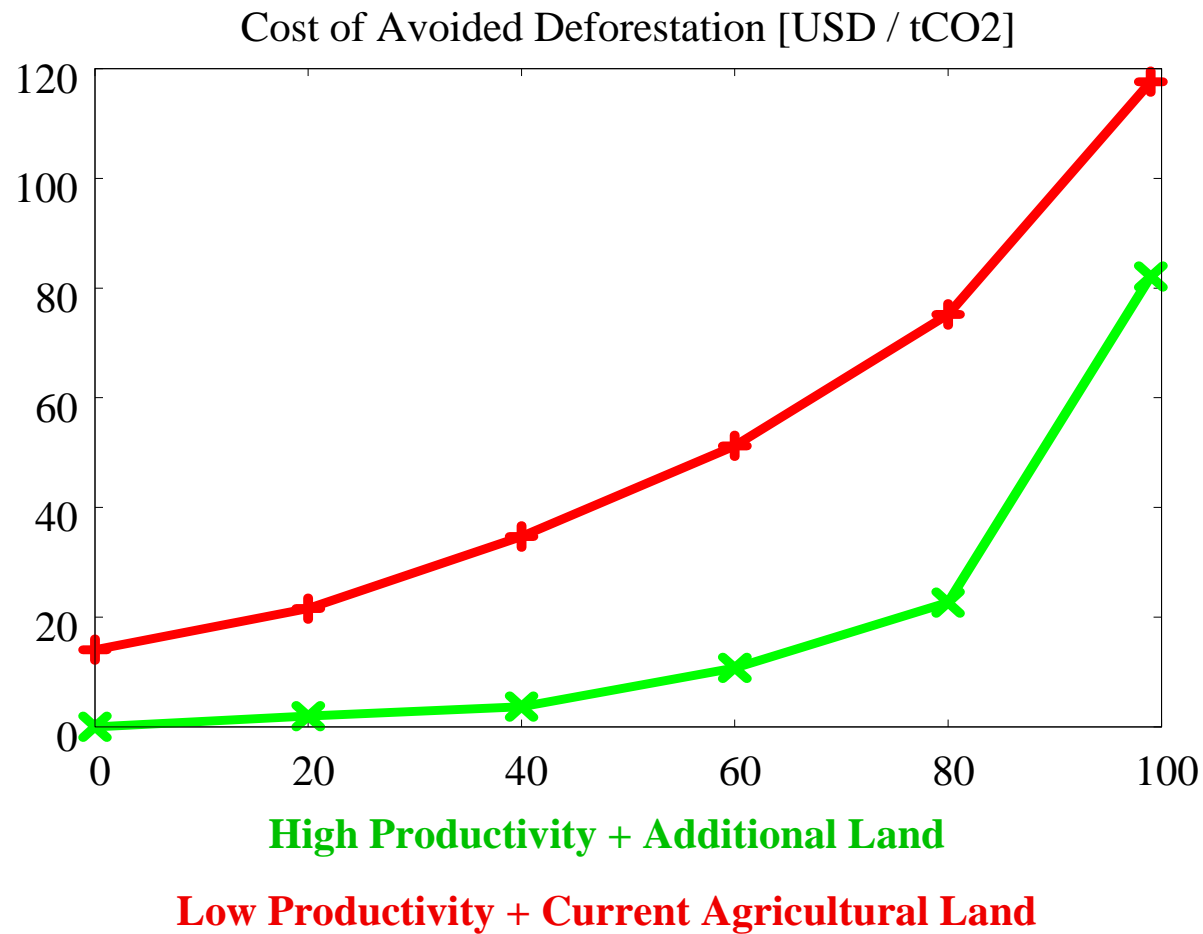
Additional Land 2030 updated baseline.

CO2 Emissions from Deforestation [MtCO2/Year]



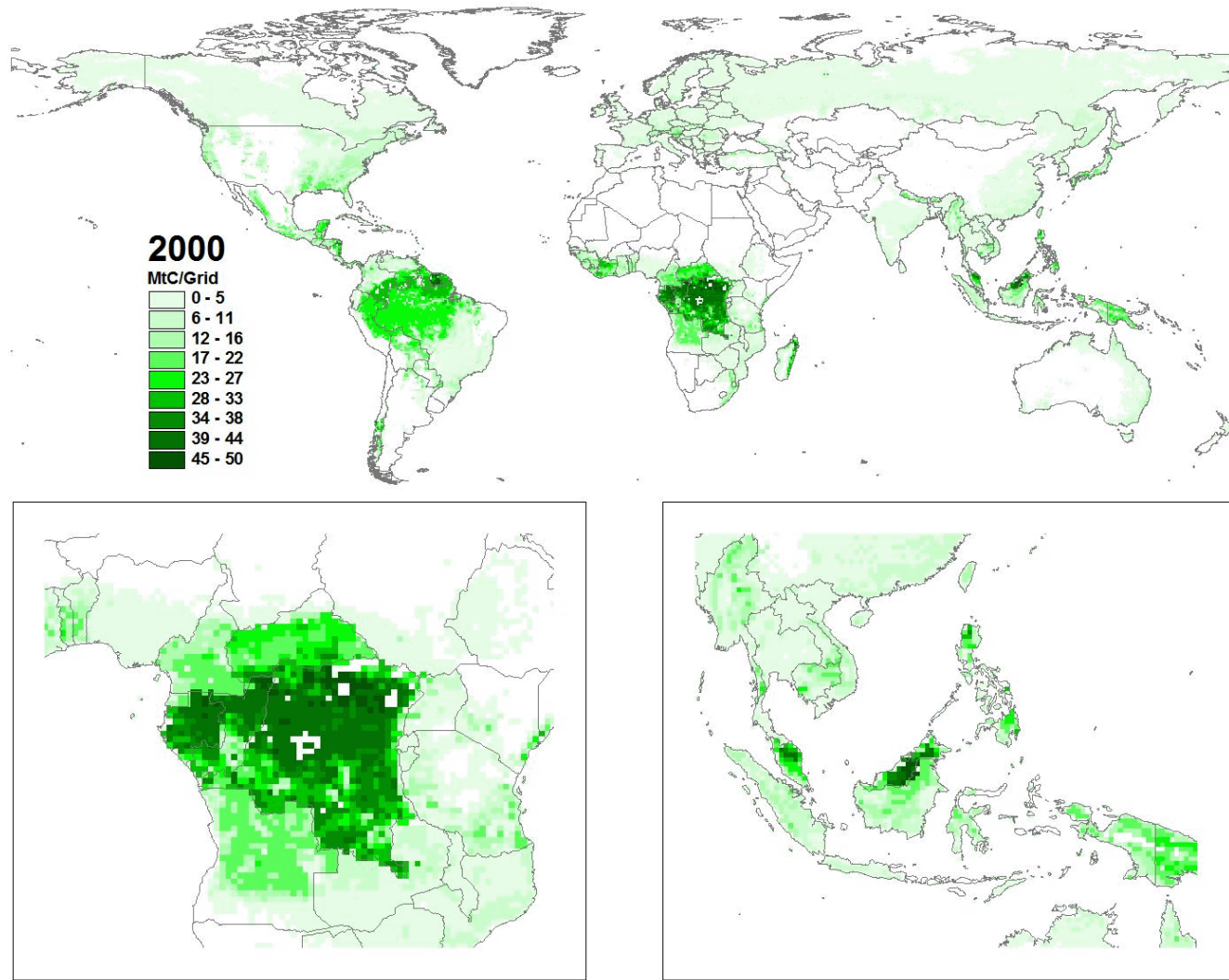
Quantity driven scenarios → Opportunity costs of avoided deforestation

IV. Numerical analysis - RED: Cost



Success depends on the right ²²baseline!

Forest Area Development A2r





(B)



(C)

Validate the region of the polygons:

	correct	not sure	incorrect	
MODIS:	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Woody Savannahs
GlobCover:	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Mosaic Forest-Shrubland/Grassland
GLC-2000:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Cultivated and managed areas

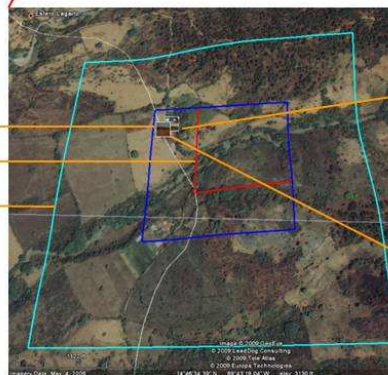
Provide picture URLs if available:

show

More information about validation:

Highres image

Submit Cancel



Geo-Wiki Project



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Help Improve Global Land Cover:

The Geo-Wiki Project is a global network of volunteers who wish to help improve the quality of global land cover maps. Since large differences occur between existing global land cover maps, current ecosystem and land-use science lacks crucial accurate data (e.g. to determine the potential of additional agricultural land available to grow crops in Africa). Volunteers are asked to review hotspot maps of global land cover disagreement and determine, based on what they actually see in Google Earth and their local knowledge, if the land cover maps are correct or incorrect. Their input is recorded in a database, along with uploaded photos, to be used in the future for the creation of a new and improved global land cover map.

First Steps:

To use our viewer, you need:

- Activated JavaScript - [details](#)
- Google Earth Plug-in - [details](#)

Instructions For Use:

[View](#) the instructions on a separate page or [Download](#) the english instructions as PDF

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Try our application as guest user without login. See how it works and then register.

[Try as guest](#)

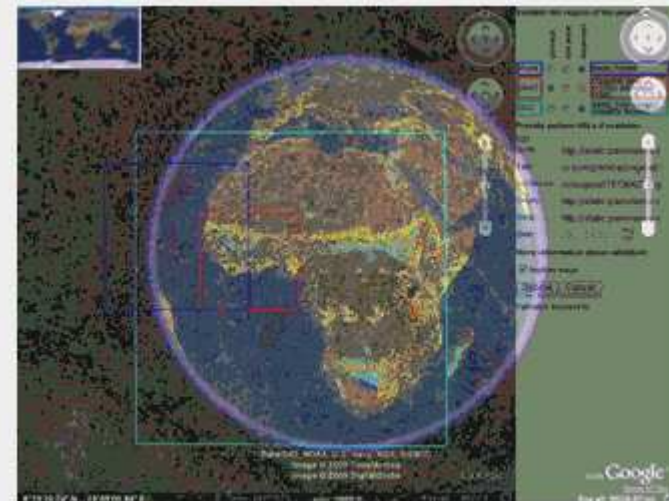
Login existing user

Email:

Password:

Remember me on this computer.

[Register here!](#)



- Your Work Matters a lot for REDD and Forestry
- There is a lot more to be done when it comes to integrated forest management – What is the most cost effective Monitoring Strategy?
- Interoperability with Economic Models

www.geo-wiki.org