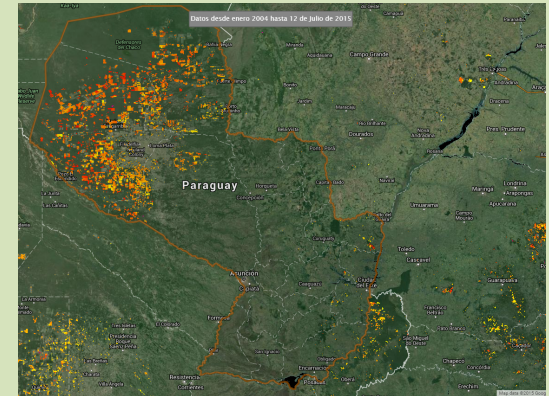


# Indirect Impact Assessment of the road segment San Juan Nepomuceno to Ruta 6 in Paraguay.



**Louis Reymondin**

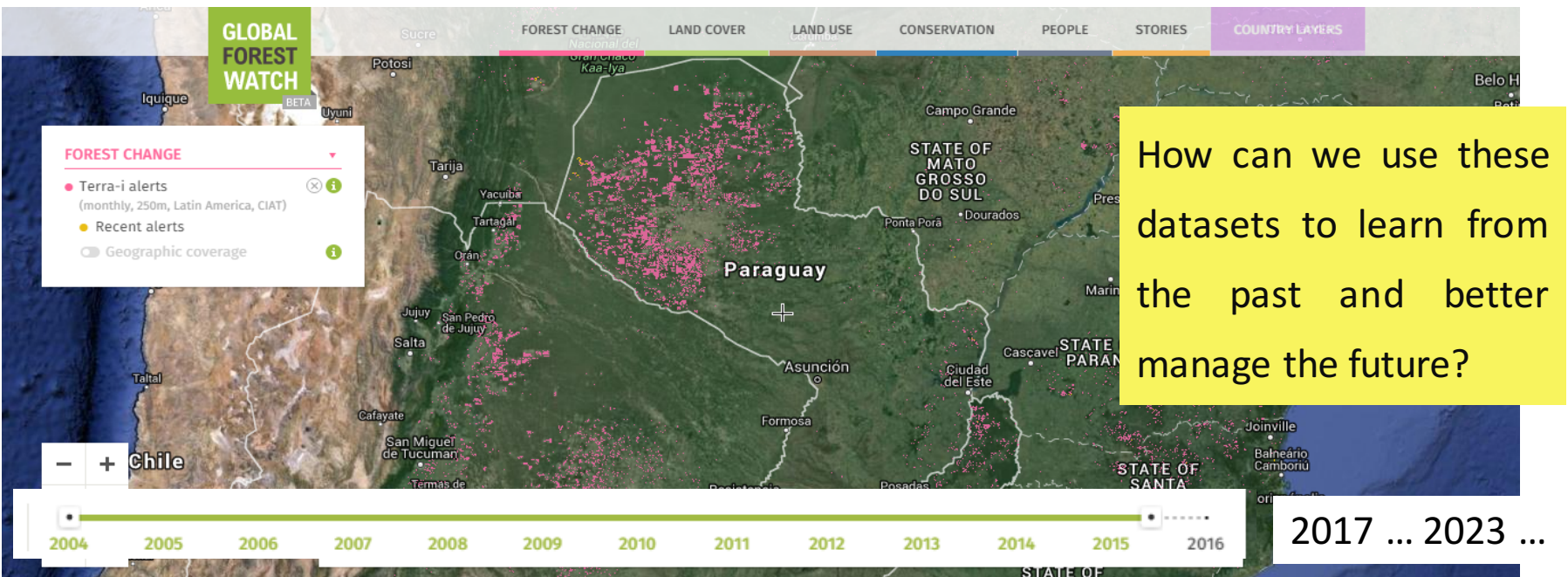
Decision and Policy Analysis Research Area (DAPA)  
International Center for Tropical Agriculture (CIAT)



# Introduction



- Many datasets for natural vegetation loss are now available (Terra-i, GUYRA, Global Forest Change, etc)
- Eastern Paraguay has been heavily impacted by natural ecosystems loss, which have been replaced by industrial crops and pasture for livestock



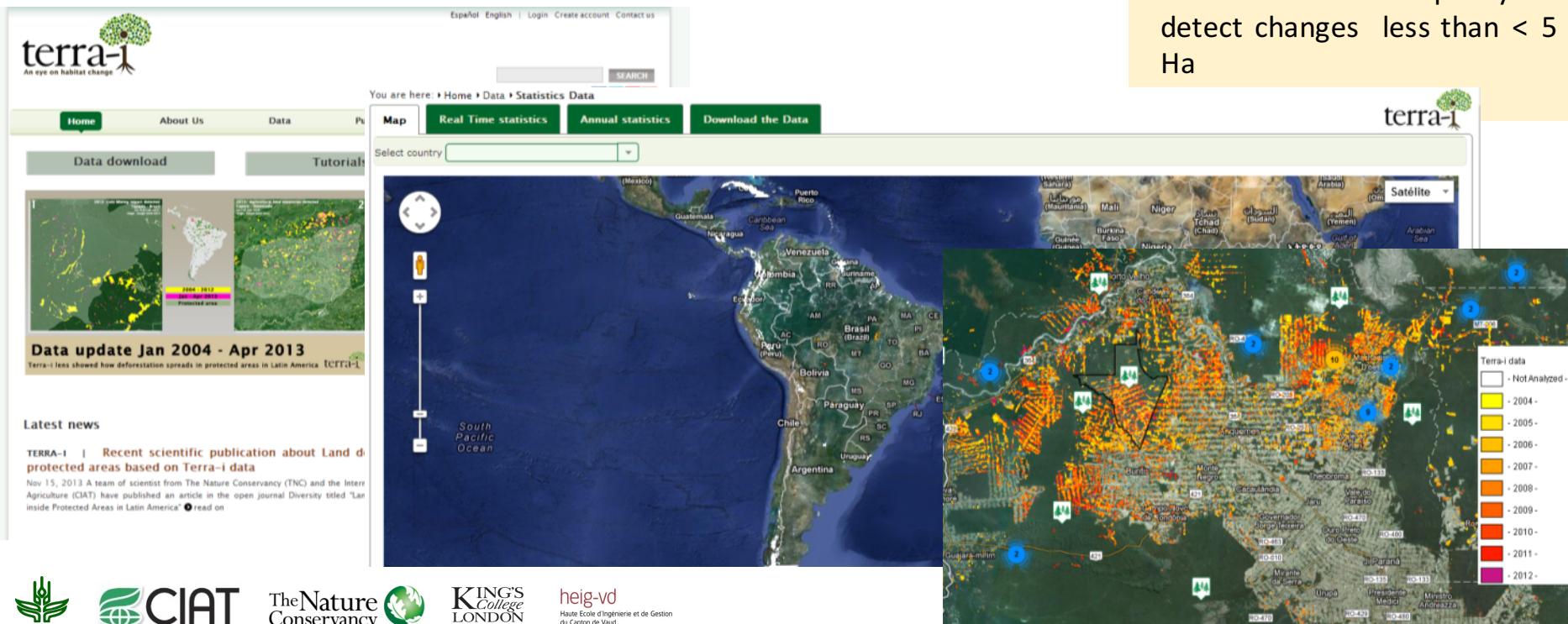
# Introduction – Terra-i bottom line

- Tool detecting natural vegetation loss in Latin America
- Near real-time system, producing maps every 16 days
- Minimum changed area detected: 6 Ha or 8 football fields
- First continental scale near real time tool in operation and the first to work outside of the Brazilian Amazon.
- Web tools available to **visualize and download** habitat status data

## Tool limitations...

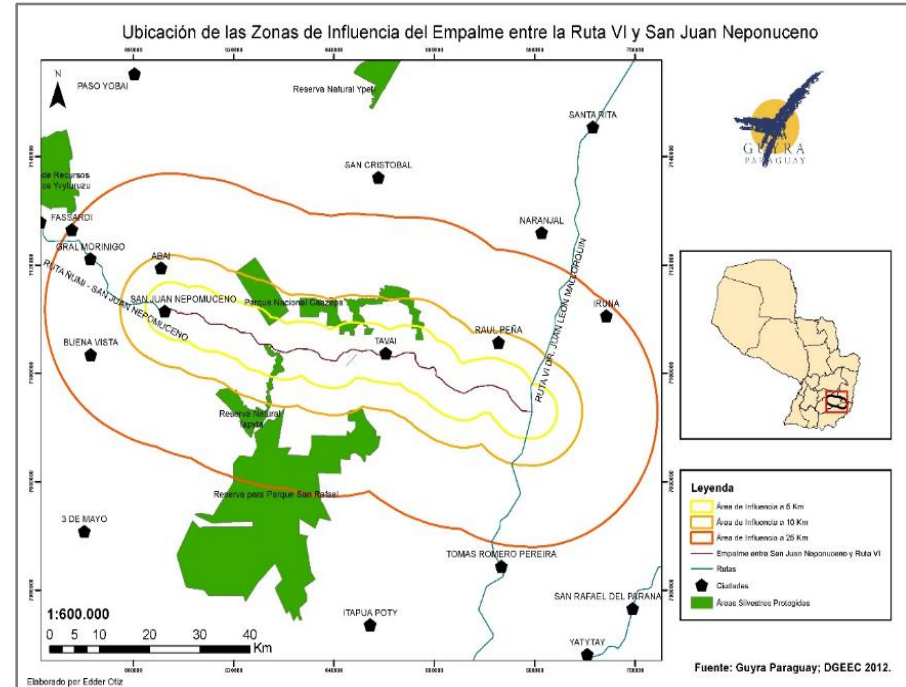
Terra-i allows identifying areas of rapid loss (hotspots) which facilitate making actions as soon as possible

However, it does not provide the exact amount of habitat loss due its low capacity to detect changes less than < 5 Ha



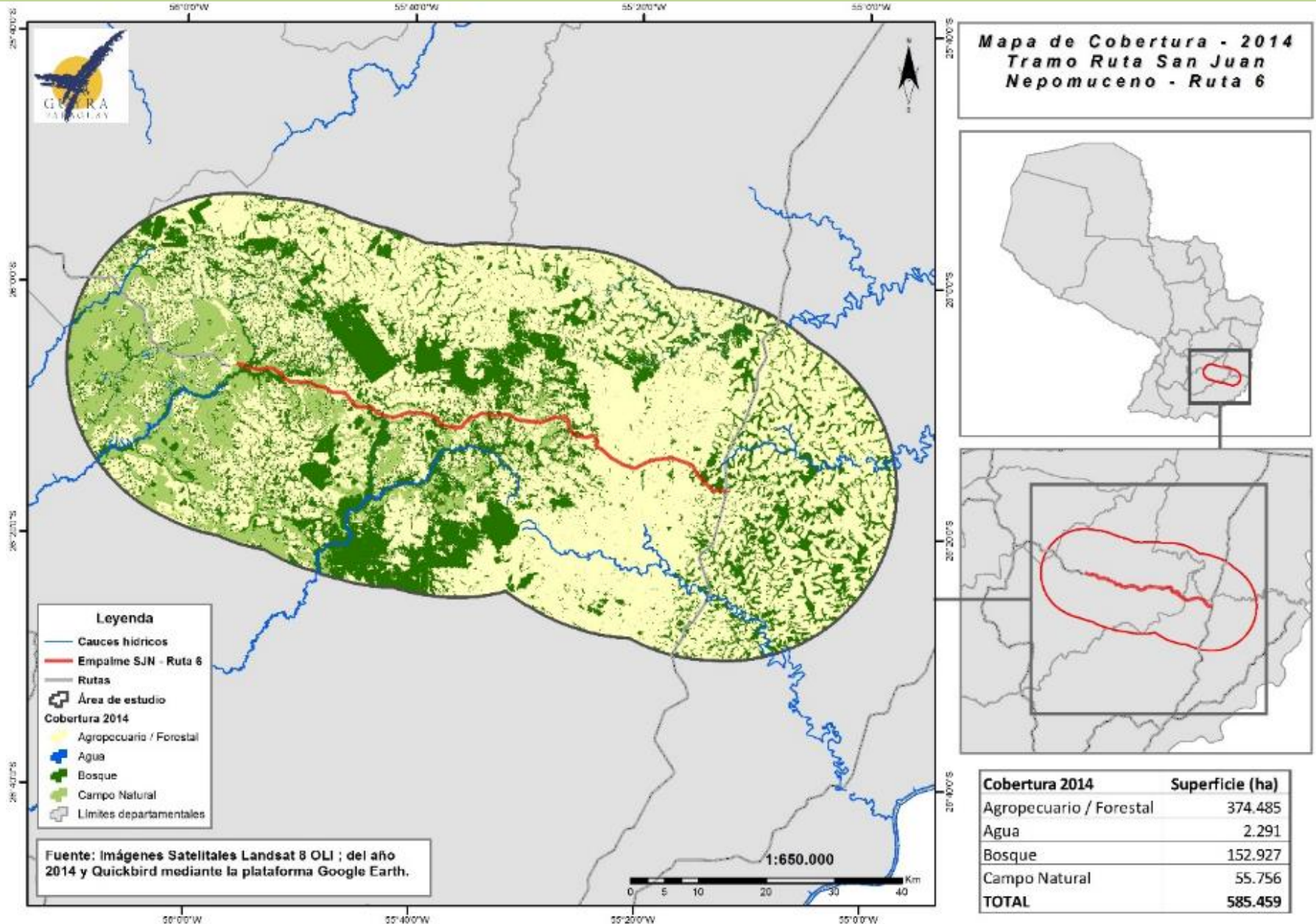
# Road segment San Juan Nepomuceno-Ruta 6 in Paraguay

- The study area under this IDB project was established creating a buffer area of 25 kilometers surrounding the 100 kilometers road segment.
- Three protected units are located in this area: *Parque Nacional Caazapá*, the *Reserva para Parque San Rafael* and the *Reserva Natural Tapyta*.
- The zero deforestation law 2524/04 was implemented in the oriental region of Paraguay "Forbidding in the Eastern Region the transformation and conversion of areas with forest cover."



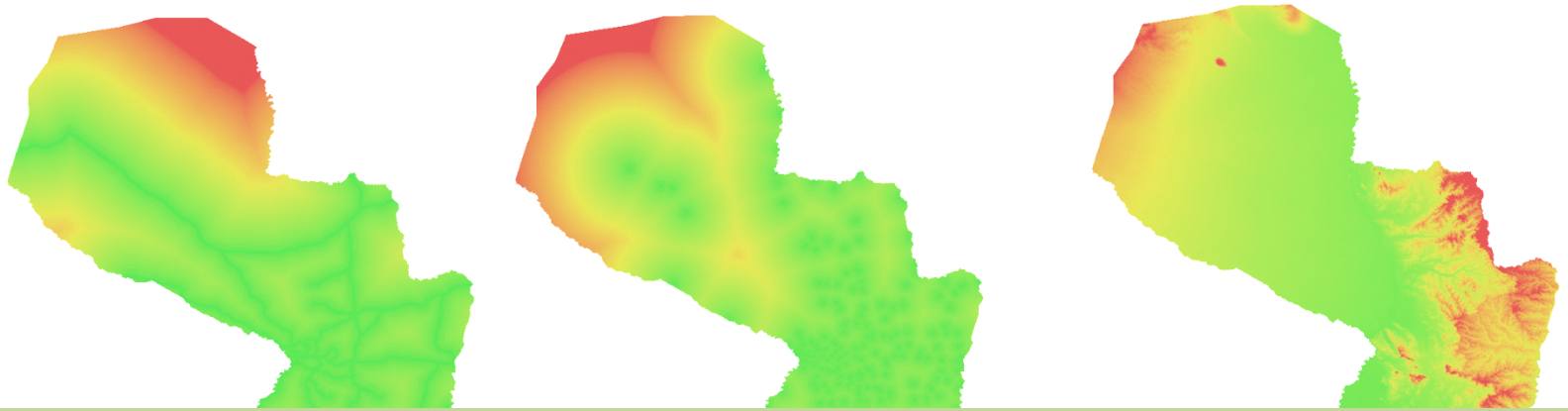


# Forest status from 1987 to 2014

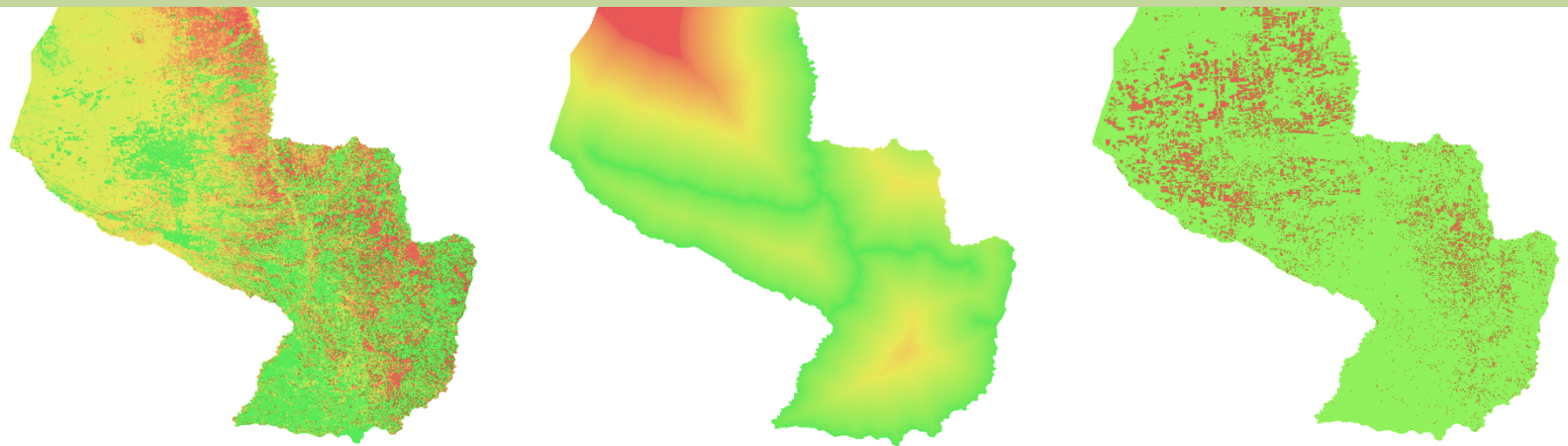


## Forest status from 1987 to 2014

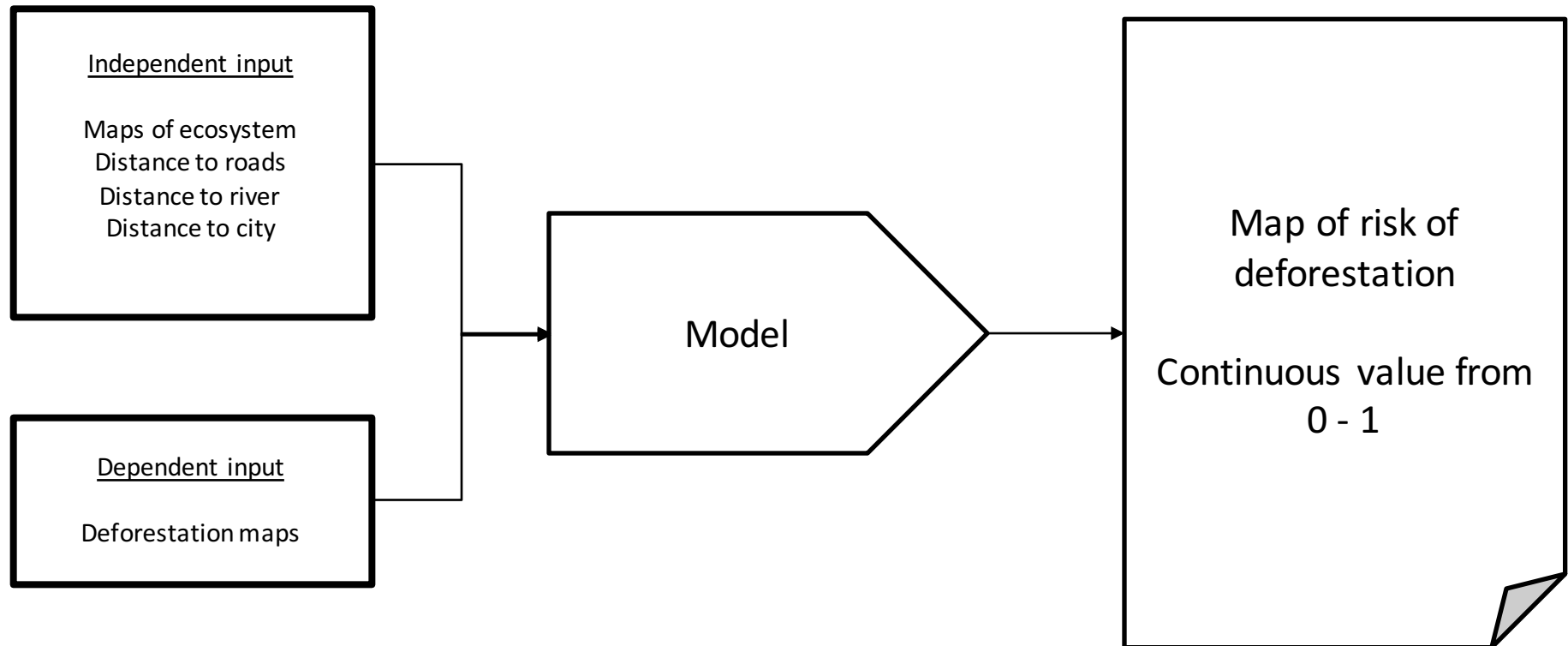
Cover	Year						
	1987	1990	1995	2000	2005	2010	2014
Agriculture / Forestry	149,458	233,663	322,605	340,121	371,923	367,661	374,485
Water	6,910	6,923	7,043	6,920	3,118	2,720	2,291
Native Forest	365,153	282,692	194,894	182,848	153,996	157,345	152,927
Natural grass lands	63,938	62,181	60,917	55,569	56,420	57,729	55,756
TOTAL	585,459						



# **FUTURE DEFORESTATION SCENARIOS, POTENTIAL ROAD IMPACTS AND RISKS**

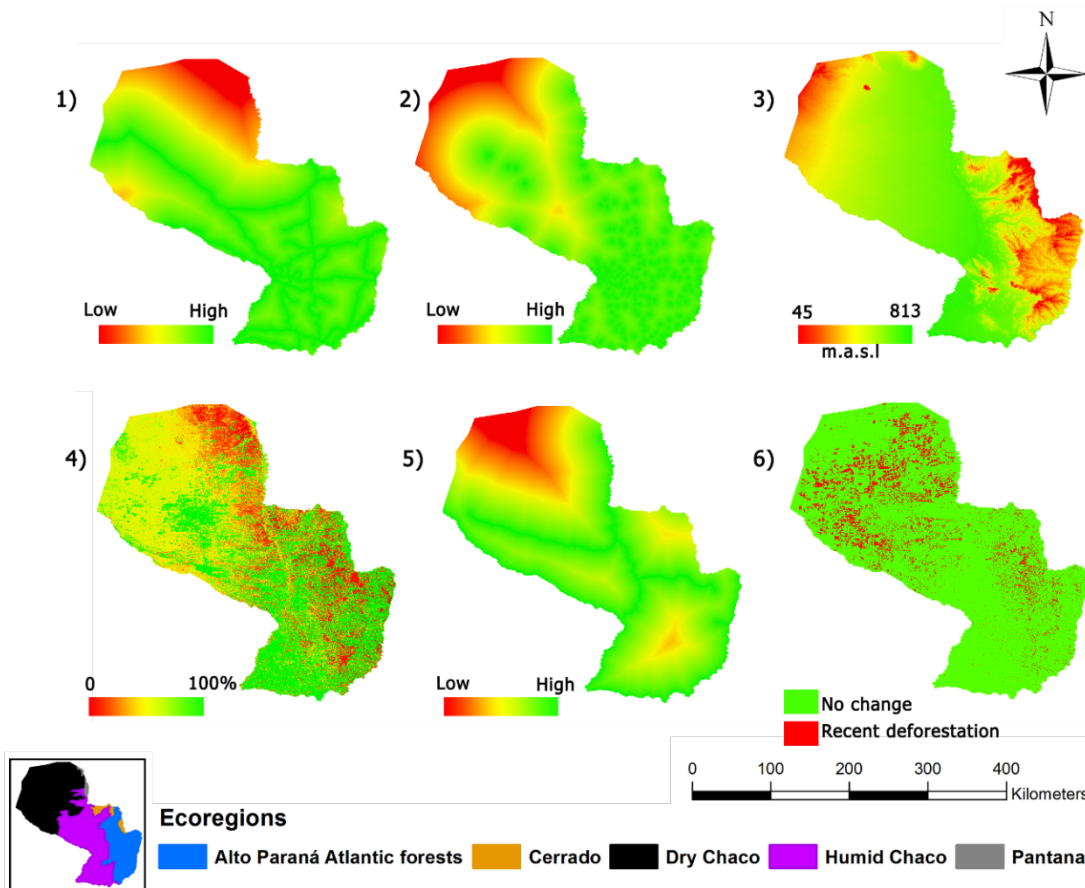


## Output



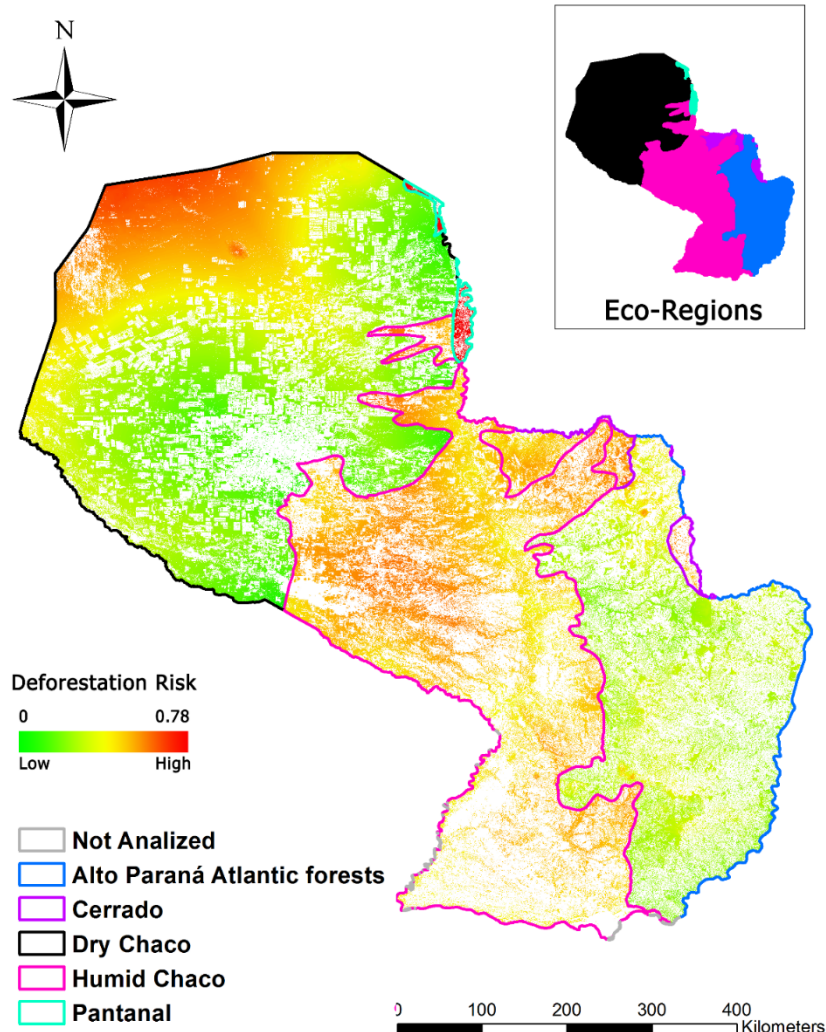


## Input



- 1) Distance to roads
- 2) Distance to cities
- 3) Elevation
- 4) Tree cover
- 5) Distance to rivers
- 6) Forest loss

# Map of risk of deforestation 2013 - 2023

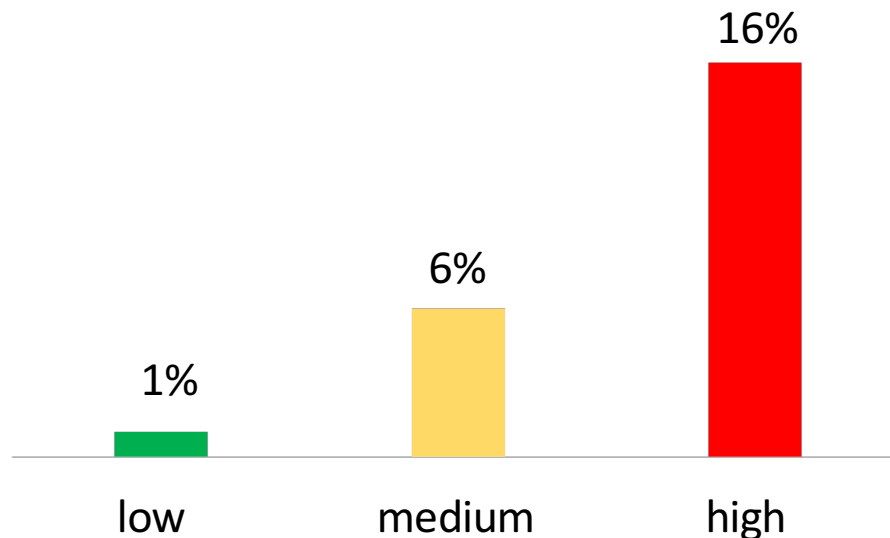


- The likelihood or risk of deforestation for the current scenario without road improvement is processed
- Values near 0 represent a low risk of deforestation
- Values near 1 represent a high risk of deforestation

# Identification of risk levels and deforestation rates



- The results were classified into 3 levels of risk: low, medium, high
- Using data from the past, deforestation rates for each level of risk are identified



## We then considerate 4 scenarios

Without road improvement



With road improvement



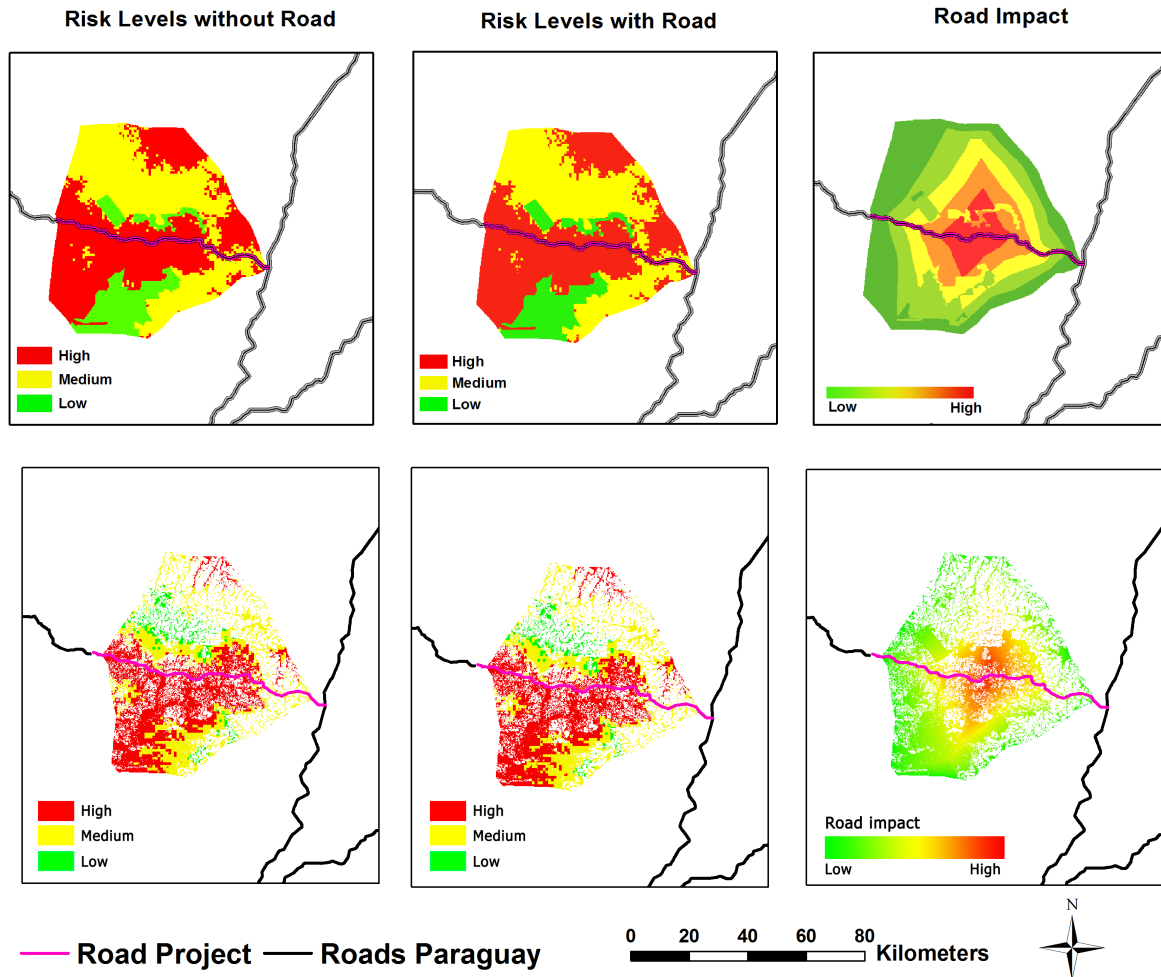
Including protected  
areas enforcement



With no protected  
areas enforcement



# Identification of the impacted area



The road impact is identified by taking the difference between the scenarios with and without the road improvement

# Impact in hectares



	With no protected areas enforcement		Including protected areas enforcement	
	Without road improvement	With road improvement	Without road improvement	With road improvement
Low	5.8%	5.7%	13%	13%
Medium	40.7%	39.2%	39.9%	38.8%
High	53.5%	55%	47.1%	48.2%

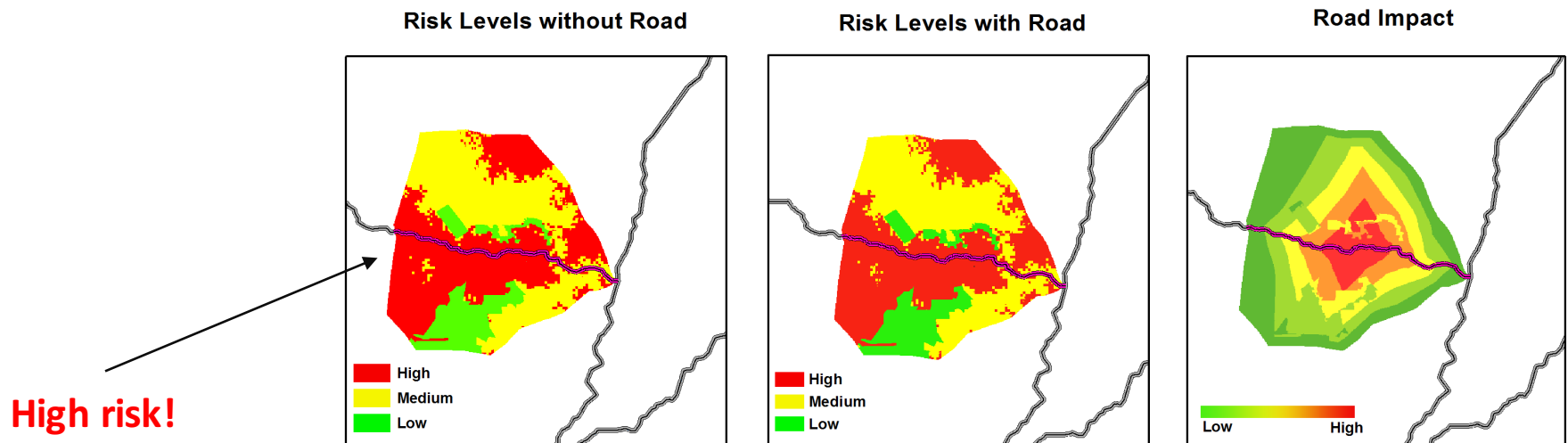
	With no protected areas enforcement		Including protected areas enforcement	
	Without road improvement	With road improvement	Without road improvement	With road improvement
Low	81	79	180	180
Medium	3.395	3.274	3.334	3.243
High	11.911	12.249	10.483	10.730
<b>Total</b>	<b>15.387</b>	<b>15.602</b>	<b>13.998</b>	<b>14.153</b>

- By 2023, the road improvement project would potentially increase deforestation by
  - 1.41% no protected area enforcement is implemented
  - 1.11% if good support is provided to the protected areas
- Areas under low risk of deforestation increase from 5.8% to 13% when strong conservation measures are applied to protected areas.

# Analysis conclusions



- The model identifies a relatively low increase of risk of deforestation.
- The risk of deforestation is currently already high



- The land are flat around the road
- There is already an unpaved road around the road

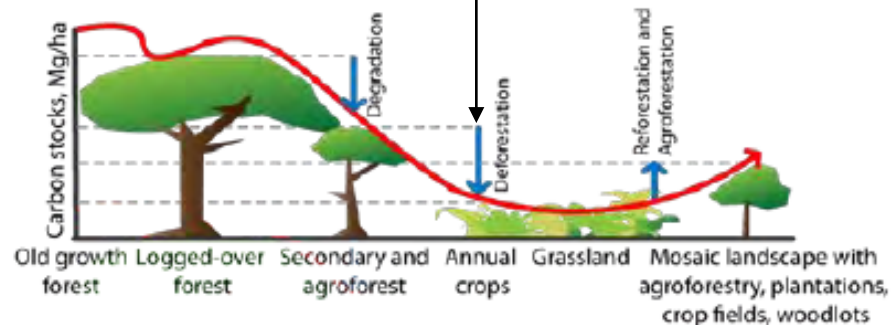
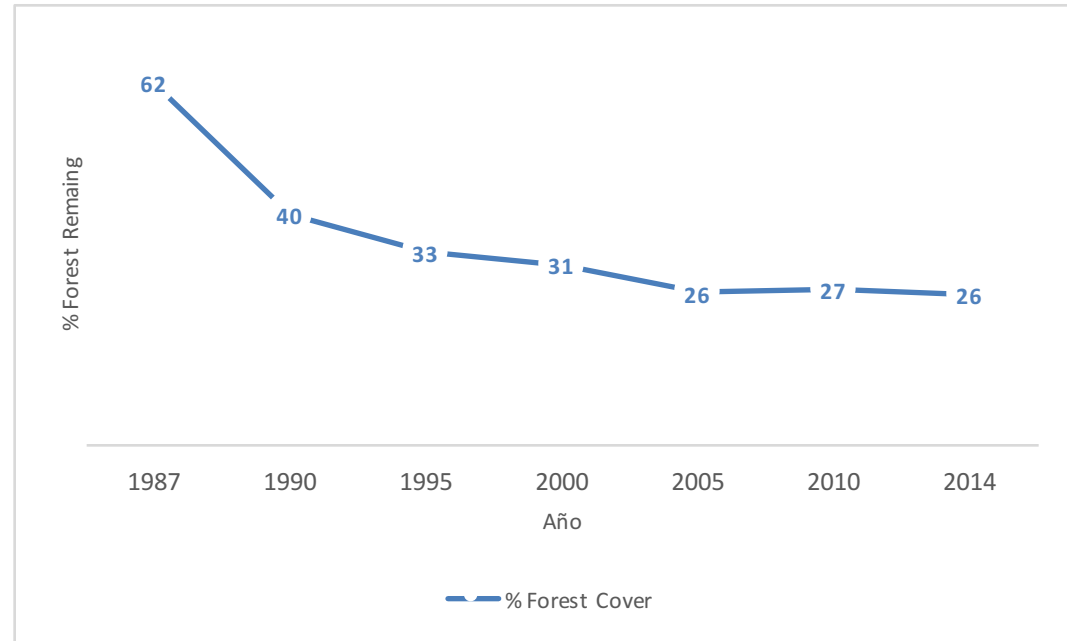


# Analysis conclusions

Forest transition curve in the studied area.

Deforestation rates for the study area are low because there is not much forest left, and what remains is mainly located in protected areas.

This is the bottom of the U-shaped curve as shown here.



- Many datasets for natural vegetation loss are now available (Terra-i, GUYRA, Global Forest Change, etc)
- **Let's use this information to better understand the past and manage better the future!**

# Thank you!

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