

Carbon stock in the state of Santa Catarina from the perspective of ecosystem services

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CONTEXT

Ecosystem Services Assessment in Santa Catarina State, Brazil



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DO ESTADO DE
SANTA CATARINA

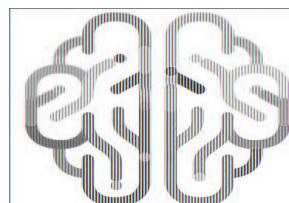


Chaire de recherche du Canada
en économie écologique

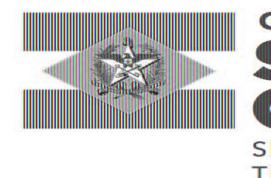


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Fundação de Amparo à
Pesquisa e Inovação do
Estado de Santa Catarina



- Long-term Project.
- Main Objective

Evaluation of Santa Catarina State's potential for payments for ecosystem services.
- Specific objectives
 1. Evaluate the supply and demand for ES in Santa Catarina;
 2. Evaluate the potential contribution of ES in the state's economy;
 3. Identify priority areas for PES programs in the state.

How do we intend to do this?

1º Selection of the main ES for Santa Catarina State

Literature review/experts

Supply and demand for ES can be determined through a combination of spatial analysis and economic valuation (Kermagoret and Dupras, 2018)

2º ES Supply evaluation

Mapping thecniques

Service-Provide Units (SPU) of each ES

Map Standardization/Overlay – ES *Hotspots*

InVEST

integrated valuation of
ecosystem services
and tradeoffs



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QGIS

How do we intend to do this?

3º ES Demand Evaluation

Economic Valuation – Total Economic Value (TEV)

Technique will be chosen according to the ES being assessed

Based on market valuation

Contingent valuation method (WTP)

4º Joint analysis

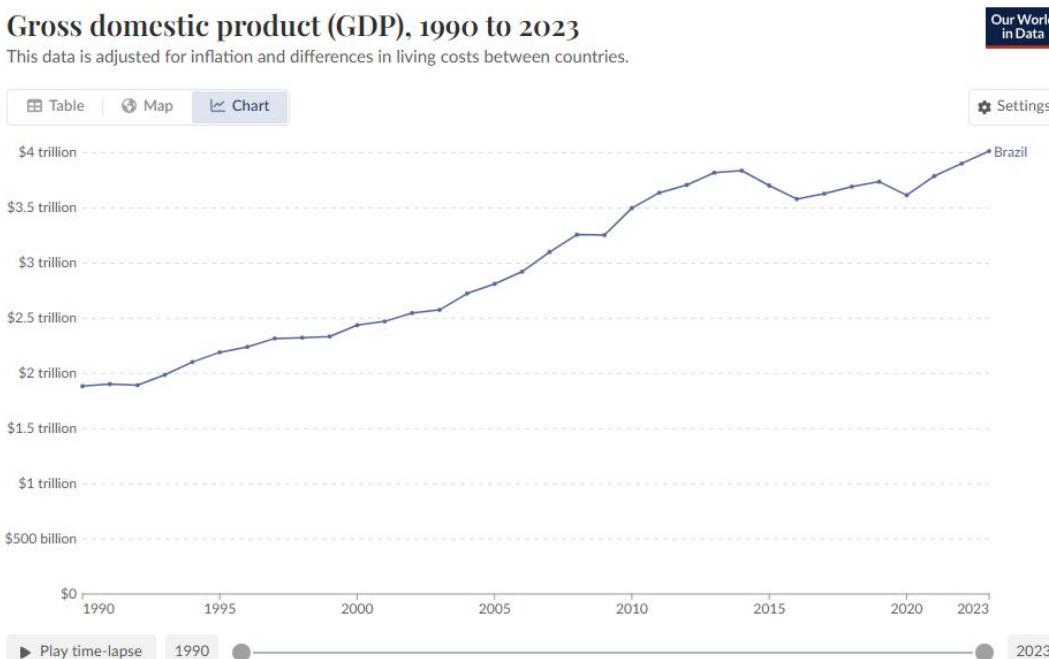
Potencial ES for SC (priority areas/impacts)

WHY ARE WE DOING THIS?

- Increase of world population
- Search for economic development

Gross domestic product (GDP), 1990 to 2023

This data is adjusted for inflation and differences in living costs between countries.



Population, 1950 to 2023

Table

Map

Chart

8 billion

7 billion

6 billion

5 billion

4 billion

3 billion

2 billion

1 billion

0

1950

1960

1970

1980

1990

2000

2010

2020

2023

Play time-lapse

1950

2023

Data source: UN, World Population Prospects (2024) – [Learn more about this data](#)

Note: Values as of 1 July of the indicated year.

OurWorldInData.org/population-growth | CC BY

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WHY ARE WE DOING THIS?

- Pressure on ecosystems
 - Deforestation
 - Degradation
 - Pollution



SANTA CATARINA STATE



PES and Carbon Policies in Brazil

- Late development
- Federal Law nº 14.119/2021
- Santa Catarina State Law nº 15.133/2010
- Federal Law nº 15.042/2024 – Regulated Carbon Market
- PES programs based on water and carbon



Programa Produtor de Água

Sistema Nacional de Informações sobre Recursos Hídricos

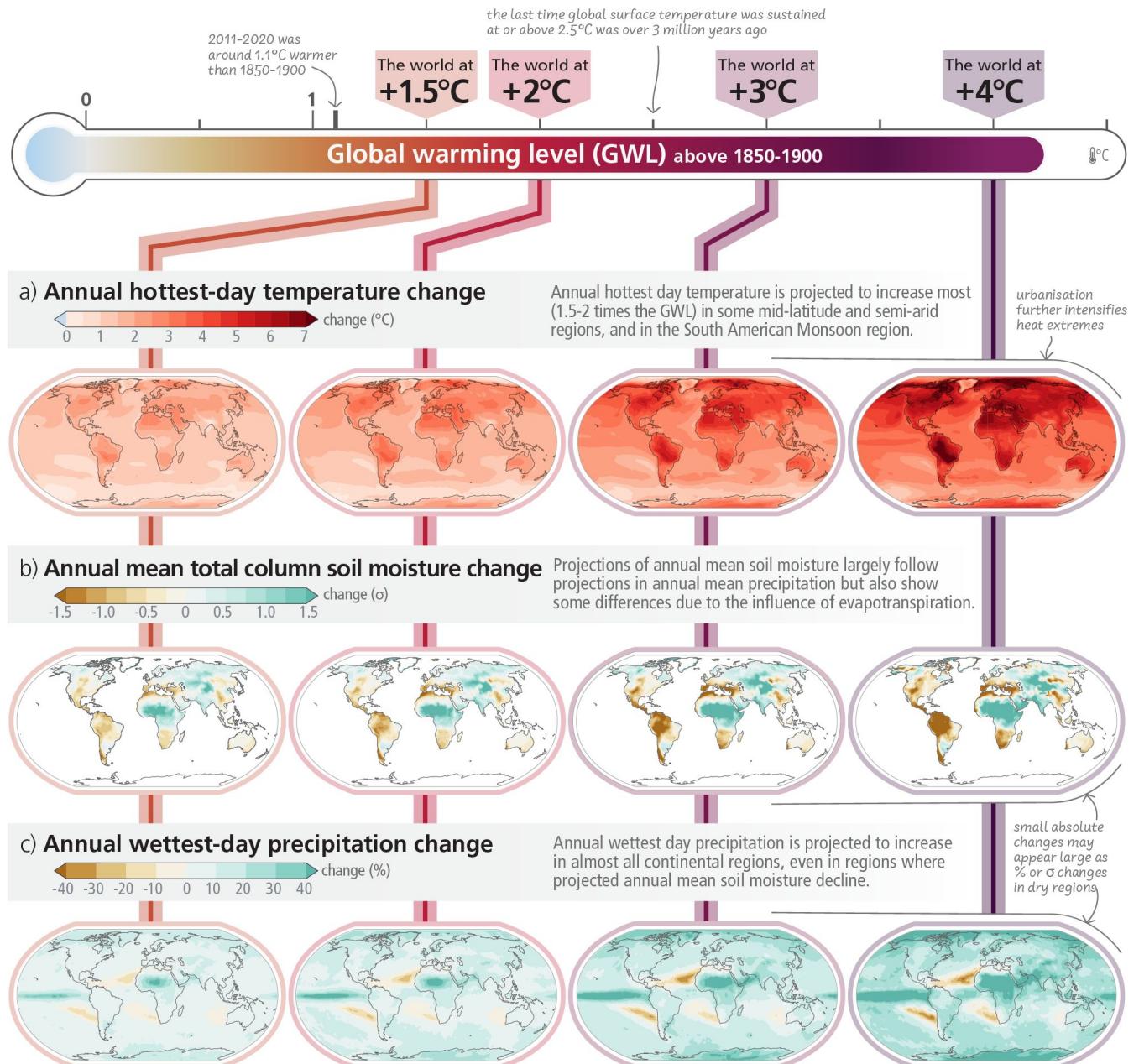
Encontrar endereço ou lugar



With every increment of global warming, regional changes in mean climate and extremes become more widespread and pronounced

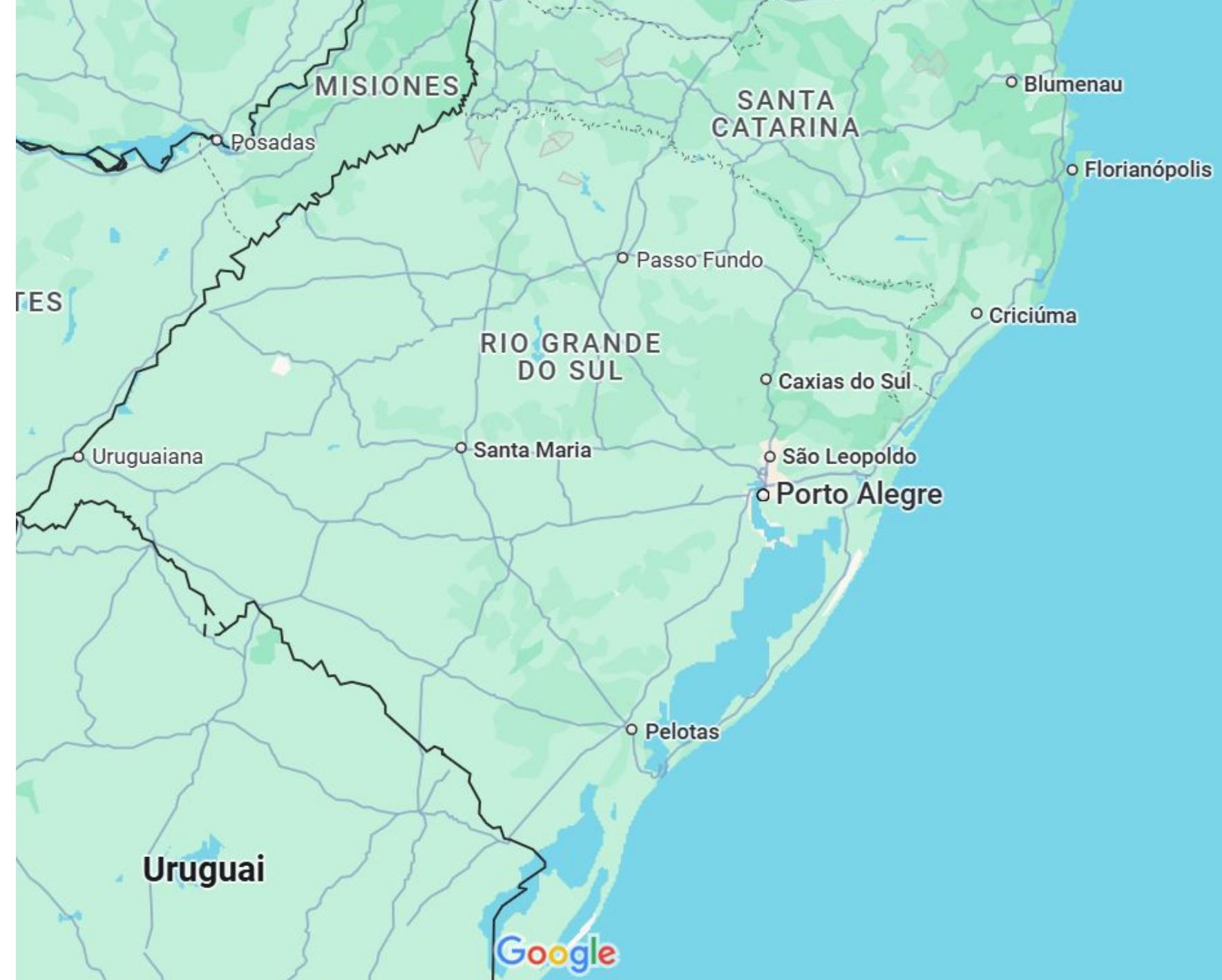
WHY SHOULD WE START WITH CARBON?

- Climate Change



Source: IPCC Report (2023)

**MAY, 2024,
RIO GRANDE
DO SUL,
BRAZIL**





What about the study of carbon?

Pilot Project

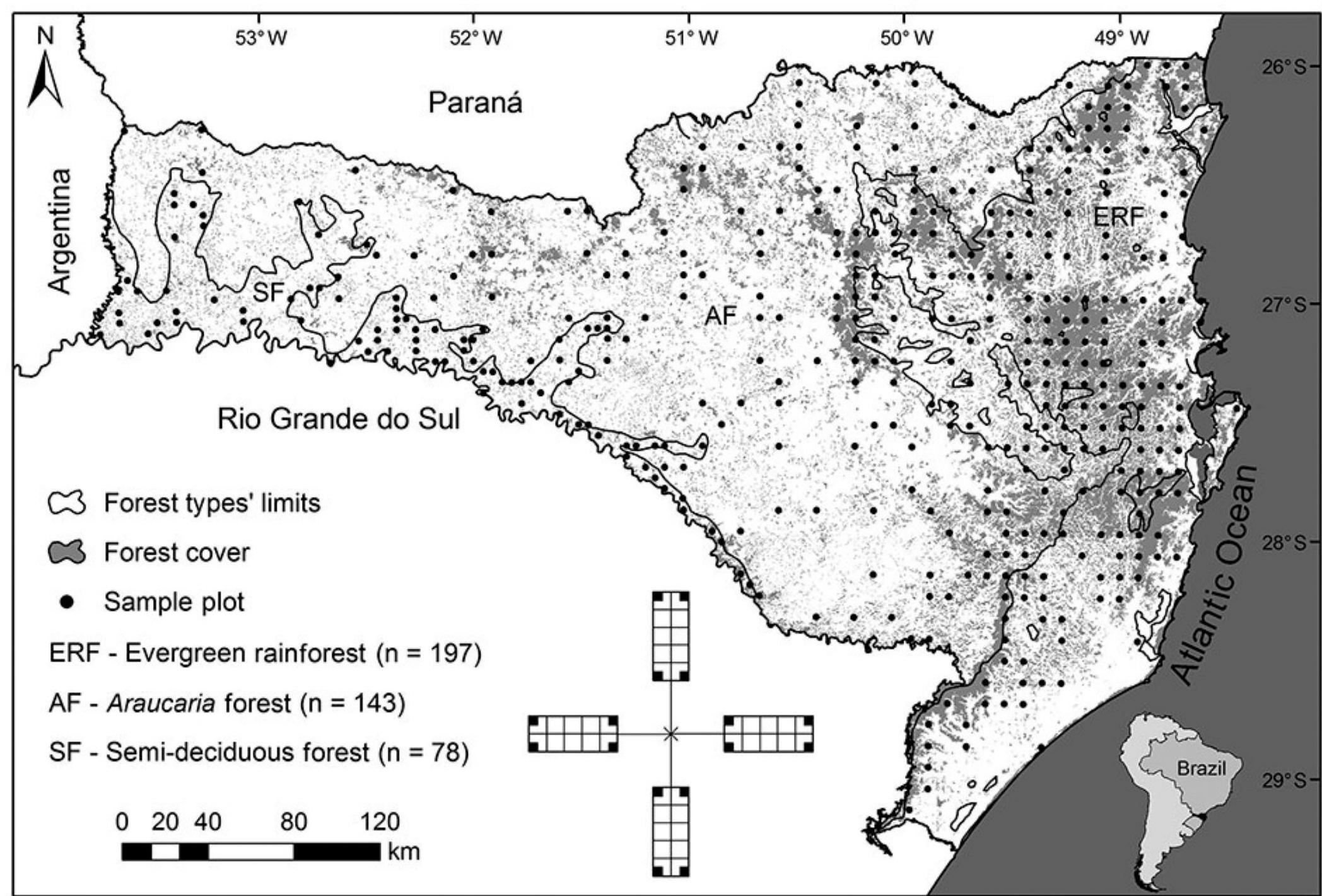
Goal:

To estimate the carbon stock for the state of Santa Catarina

Methodology:

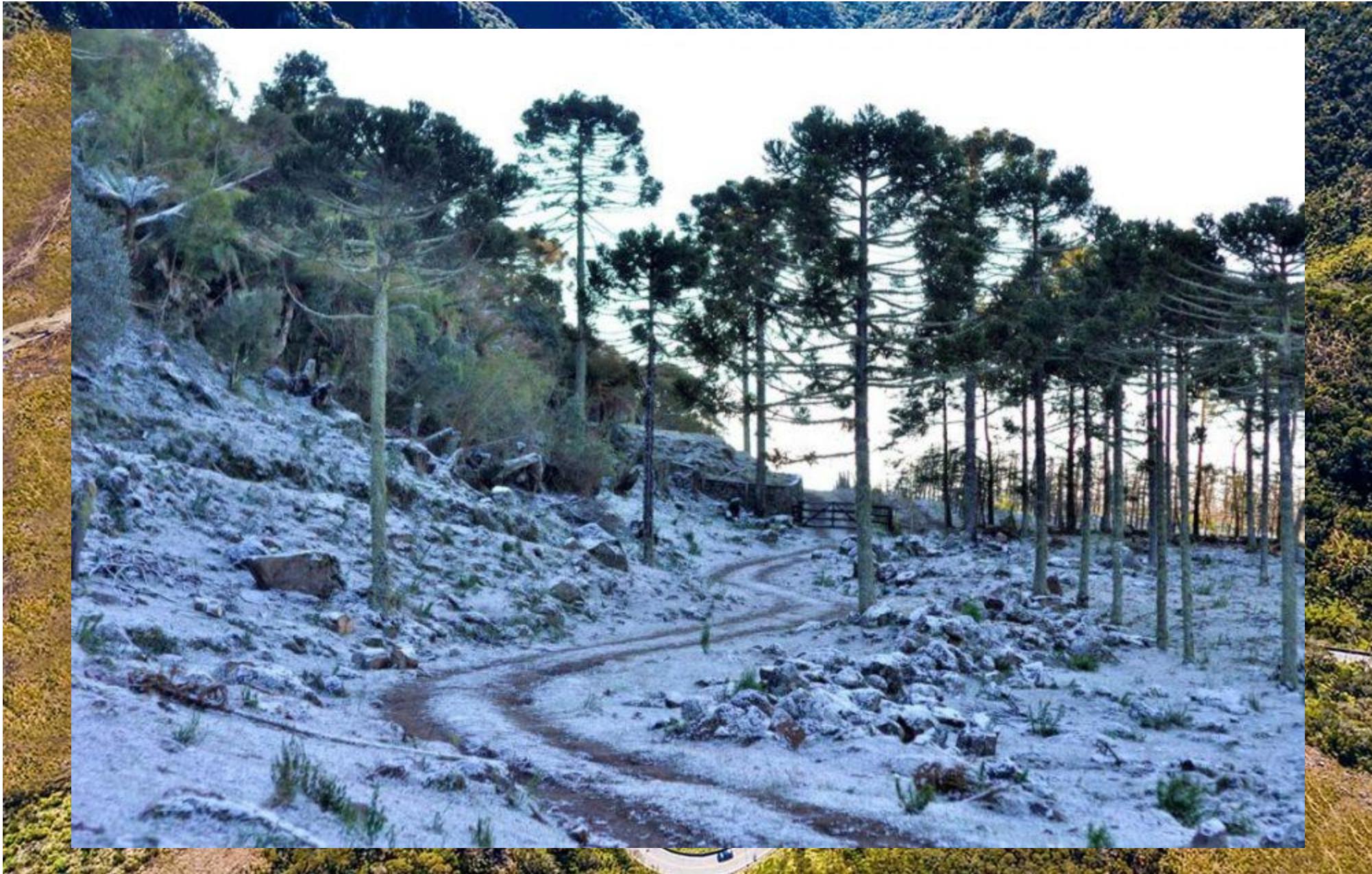
LULC map provided by the Floristic-Forest Inventory of Santa Catarina

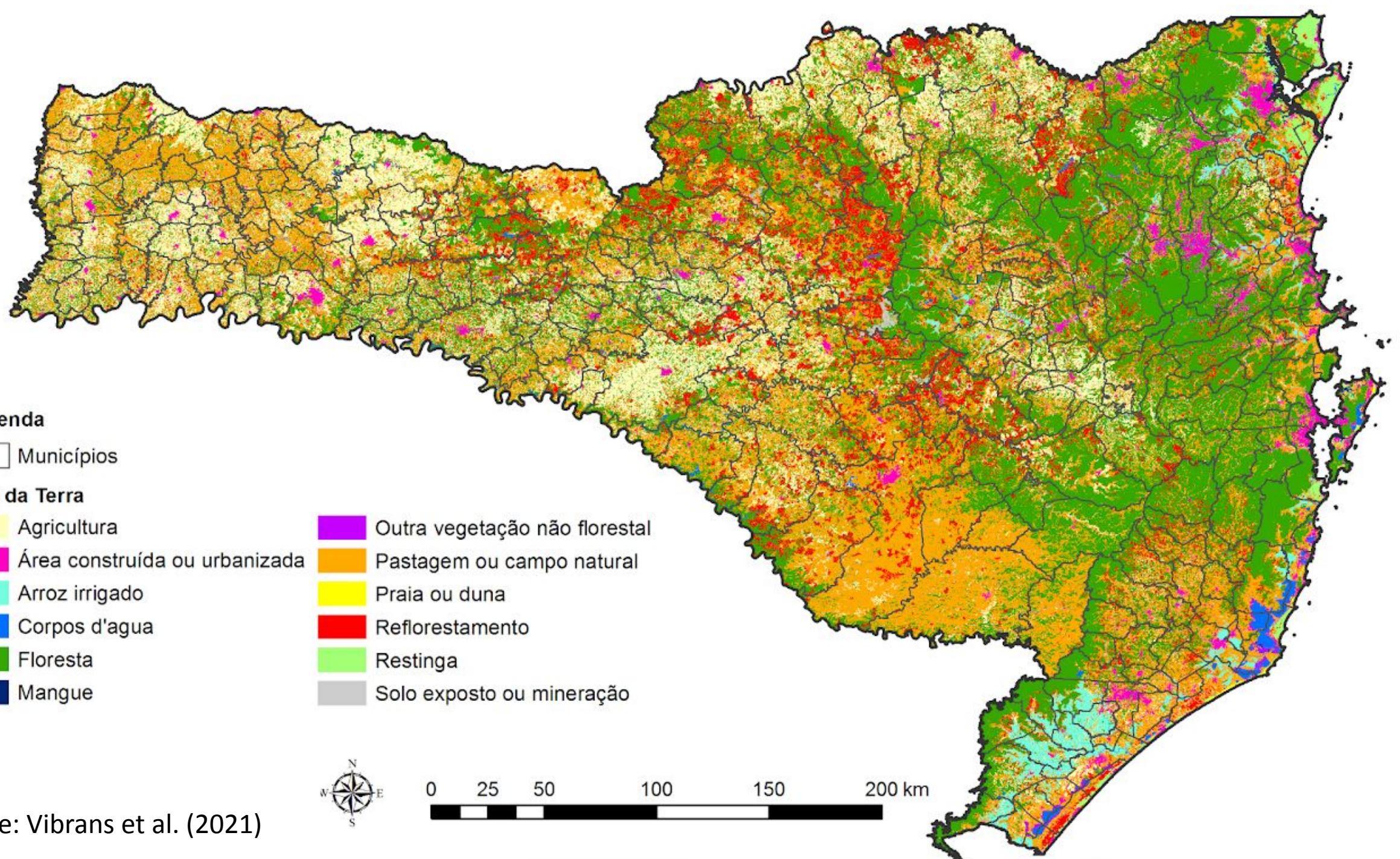
Literature review to determine the carbon density of belowground and aboveground biomass, of the soil and dead matter



Source: Vibrans et al. (2020)





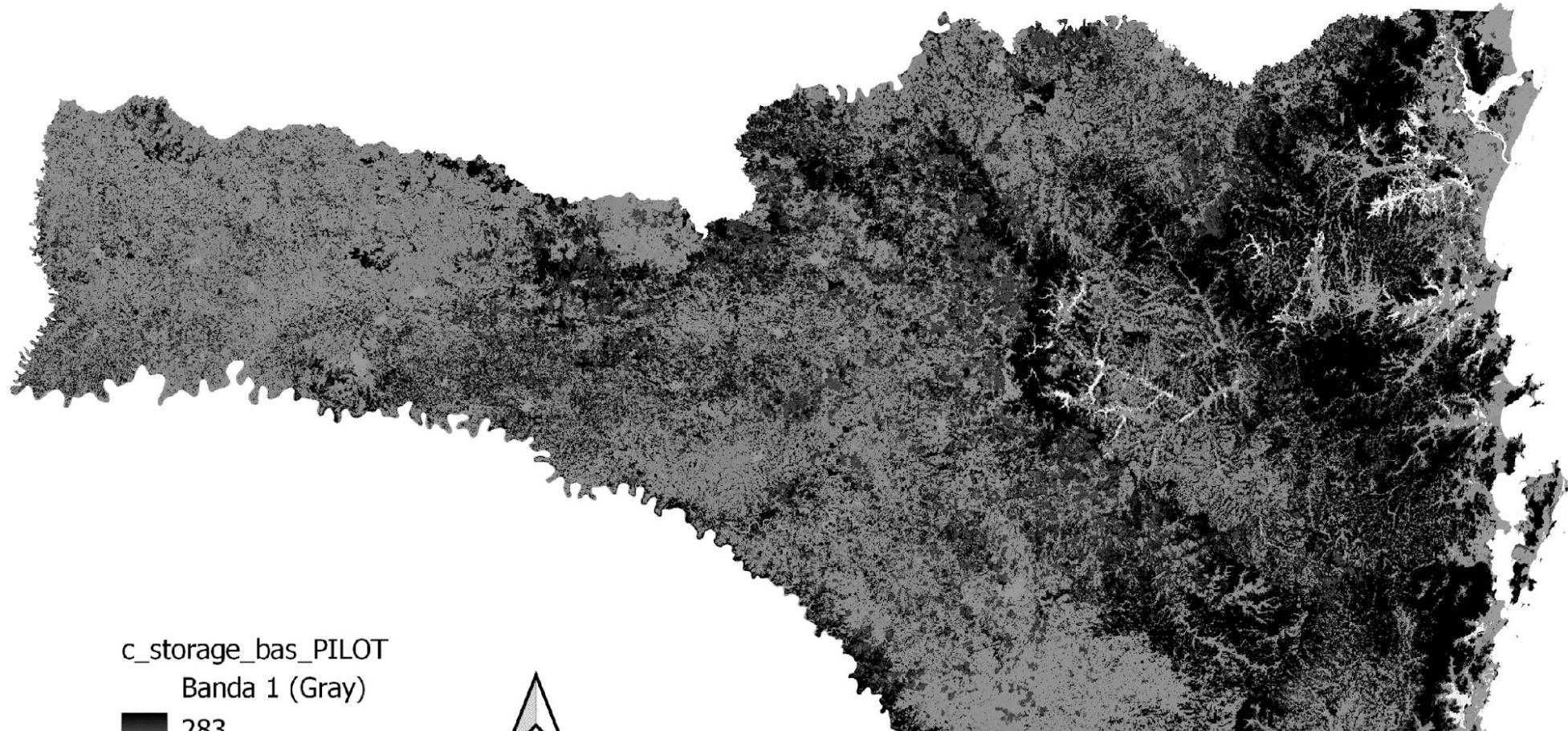


Source: Vibrans et al. (2021)

[Annual Water Yield](#)[RouteDEM](#)

[Carbon Storage and Sequestration](#)

[Scenario Generator: Proximity B...](#)[Coastal Blue Carbon Preprocessor](#)[Scenic Quality](#)[Coastal Blue Carbon](#)[Seasonal Water Yield](#)[Coastal Vulnerability](#)[Sediment Delivery Ratio](#)[Crop Pollination](#)[Urban Cooling](#)[Crop Production: Percentile](#)[Urban Flood Risk Mitigation](#)[Crop Production: Regression](#)[Urban Nature Access](#)[DelineateIt](#)[Urban Stormwater Retention](#)[Forest Carbon Edge Effect](#)[Visitation: Recreation and Tourism](#)[Habitat Quality](#)[Wave Energy Production](#)



c_storage_bas_PILOT

Banda 1 (Gray)



0 50 100 km



Aggregate Results

| Description | Value | Units |
|-------------------------|---------------|-------------|
| Baseline Carbon Storage | 2020365623.43 | metric tons |

CONCLUSIONS - What do we expect?

We want to show Santa Catarina's potential for PES

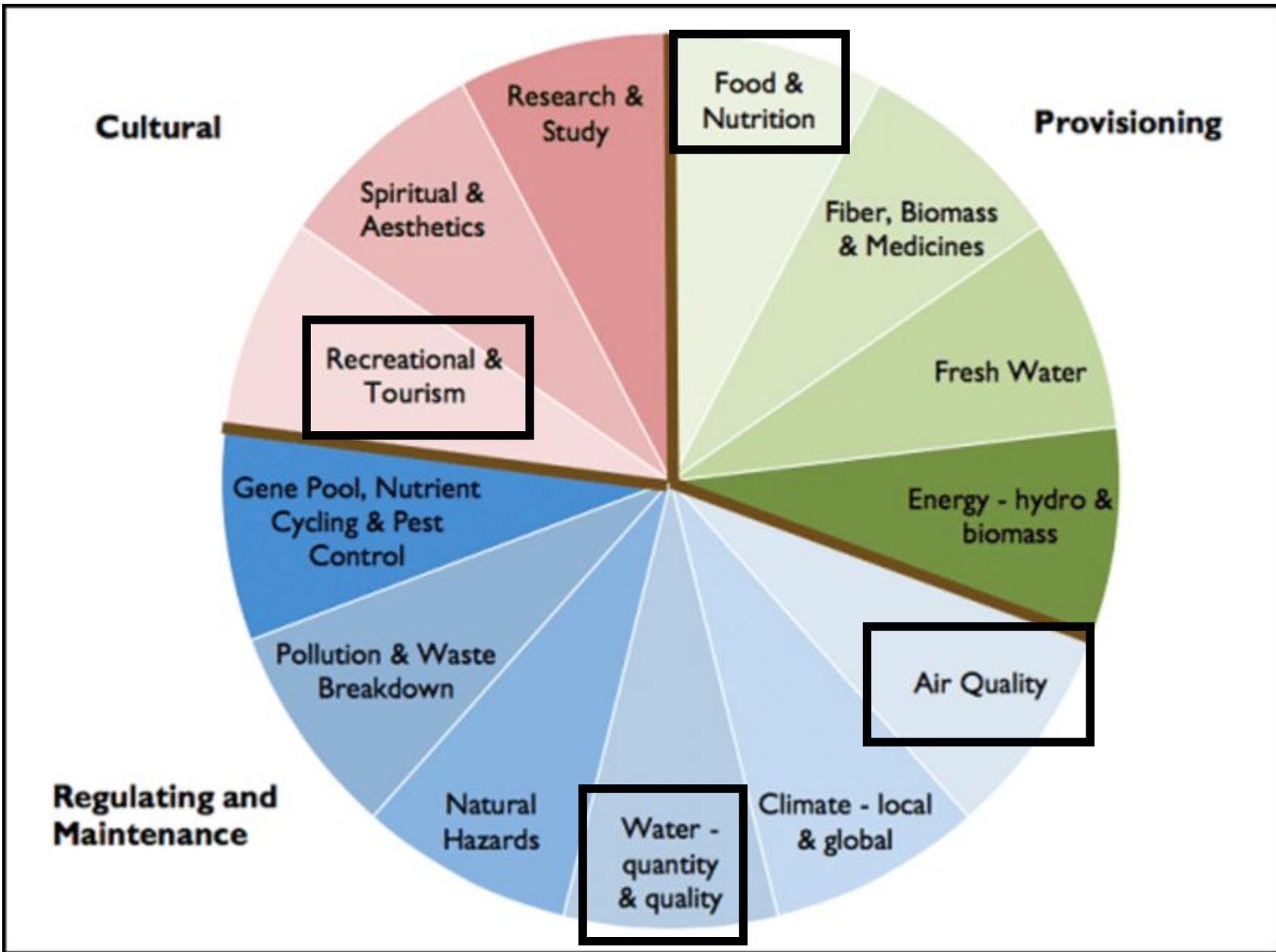
To support the regulation of SC State Policy on PES

Next Steps:

Validate data

Smaller areas

Other ES



MUITO OBRIGADO

THANK YOU

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<https://www.udesc.br/cav/ppgef/presentation>