

Environmental Economics Lab

Project Assignment

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What are we studying?

- ▶ We have learned quite a bit about working with spatial data
 - ▶ Python 101
 - ▶ Working with non-spatial data (pandas)
 - ▶ Reading Feature and Raster data (geopandas and rasterio)
 - ▶ Merging spatial data (to some extent)
 - ▶ Getting statistics from spatial data (to some extent)
- ▶ Now we can finally work on your project assignment!
 - ▶ The whole purpose of this project is to employ the techniques we are learning on a **real world problem**
 - ▶ However, you will get from this exercise as much as you put into it

Research Question

- ▶ **Your project:** How does the floods spatial heterogeneity shape the city of Rio de Janeiro?
- ▶ Each group will be choose between 2 and 3 administrative regions to study.
 - ▶ Ideally, they share a border
 - ▶ All groups must study at least 2 administrative regions
- ▶ You must describe the **associations** between flood propensity and other demographic/environmental/urbanistic features
 - ▶ You **need not** to infer about causality!!! ⇒ This is rather complicated
 - ▶ You **need** to explore correlations and descriptive statistics

Why does it matter?

- ▶ **The question**

- ▶ If you lived in Rio for more than 1 year, you know why

Why does it matter?

► The question

- If you lived in Rio for more than 1 year, you know why
- There is evidence that not only the city is shaped by the floods, but the floods are shaped by the city as well (Galvão 2009; Abreu 1987)

Why does it matter?

► The question

- If you lived in Rio for more than 1 year, you know why
- There is evidence that not only the city is shaped by the floods, but the floods are shaped by the city as well (Galvão 2009; Abreu 1987)
- This is a long-lasting urbanistic challenge with no clear answer

1969



2018



Why does it matter?

▶ The project

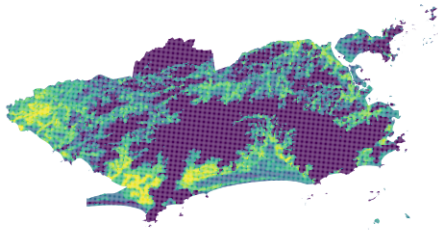
- ▶ You ARE NOT supposed to solve this problem. Do not try to sell it like this. It is a rather non-academic approach.
- ▶ You ARE supposed to study the topic. To improve our understanding of the spatial characteristics of the most and least affected areas.

▶ If we are not talking about causality, why bother?

- ▶ Stylized facts and descriptive statistics are the step 0 of any empirically based study
 - ▶ In fact, this is a "publication worthy" effort if you bring stylized facts about a barely empirically discussed subject (Akbar et al. 2023)
- ▶ If you ever want to further develop this research, you already know what to look for
- ▶ It is pedagogically interesting

Great, where do I begin?

- ▶ First, you must identify areas prone to flooding
 - ▶ You may use green coverage, terrain steepness, body of water proximity etc.
 - ▶ Conversely, you may follow Miranda (2016)
 - ▶ If you do so, discuss why!



- ▶ Second, question yourself about spatial differences
- ▶ Third, test for these differences!

Let's talk grade

- ▶ This is a somewhat big endeavor, so you are going to get your grade in three parts
 - 1st **Code (1/3)**: You will have to program in order to fulfill your analysis. You must present by the end of the course.
 - ▶ You will be graded based on clarity and accuracy
 - 2nd **Report (1/3)**: You shall present a brief report stating how you conducted your research. This document must have, at maximum, 5 pages.
 - ▶ You will be graded based on clarity and ingenuity.
 - 3rd **Presentation (1/3)**: The standard presentation that is expected from the course.
 - ▶ You will be graded based on clarity and performance.
- ▶ If, among anything, you must choose one characteristic. Be clear!

To the report example!

Bibliography I



Abreu, Mauricio (1987). *Evolução urbana do Rio de Janeiro*. 1st ed. Rio de Janeiro, Brazil: Iplanrio/Jorge Zahar Editor. 147 pp.



Akbar, Prottoy et al. (2023). “Mobility and Congestion in Urban India”. In: *American Economic Review* 113.4, pp. 1083–1111.



Galvão, Maria do Carmo Corrêa (2009). “Focos sobre a questão ambiental no Rio de Janeiro”. In: *Percursos geográficos*. 1st ed. Rio de Janeiro, Brazil: Lamparina, pp. 67–85. ISBN: 978-85-98271-71-2.



Miranda, Francis Martins (2016). “Índice de Susceptibilidade do Meio Físico a Inundações como Ferramenta para o Planejamento Urbano”. *Master's thesis*. UFRJ/COPPE. 177 pp.