PORTOFOLIO

GIS & Remote Sensing

Retnowati Sriwardani

Bachelor of Geography | Master of Geomatics Engineering

ABOUT ME

I am a Geography graduate and Geomatics Engineering Master's degree holder with strong enthusiasm for **Geographic Information Systems (GIS)** and **Remote Sensing**. Passionate and highly motivated, I am a fast learner who thrives in dynamic and data-driven environments. I enjoy transforming spatial data into meaningful insights, maps, and solutions that support environmental sustainability and strategic decision-making. With high curiosity and a continuous-learning mindset, I am always eager to explore new geospatial technologies and contribute my skills to impactful real-world applications.

PERSONAL INFORMATION

Education

- Bachelor of Geography, Halu Oleo University, 2018 – 2023
- Master of Geomatic Engineering, Sepuluh Nopember Institute of Technology, 2023 – 2025

Language

- Bahasa Indonesia (Native)
- English (Intermediate)

Contact information

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- Whatsapp: 082296105987
- Linkedin : Retnowati Sriwardani

Experience

- Stasiun Meteorologi Maritim Kendari- Kendari, Indonesia, March 2021– June 2021
- SDGs & Smart Eco Campus - Surabaya, Indonesia, April 2025– Dec 2025

Skill Set

- GIS
- Remote Sensing
- Cartography
- Geospatial Technology
- Programming & Data Analytic
- Spatial Planning

Tools

- ArcGIS
- SNAP
- QGIS
- Google Colab
- Google Earth Engine
- Global Mapper
- R Studio
- Surfer
- GPS Geodetic

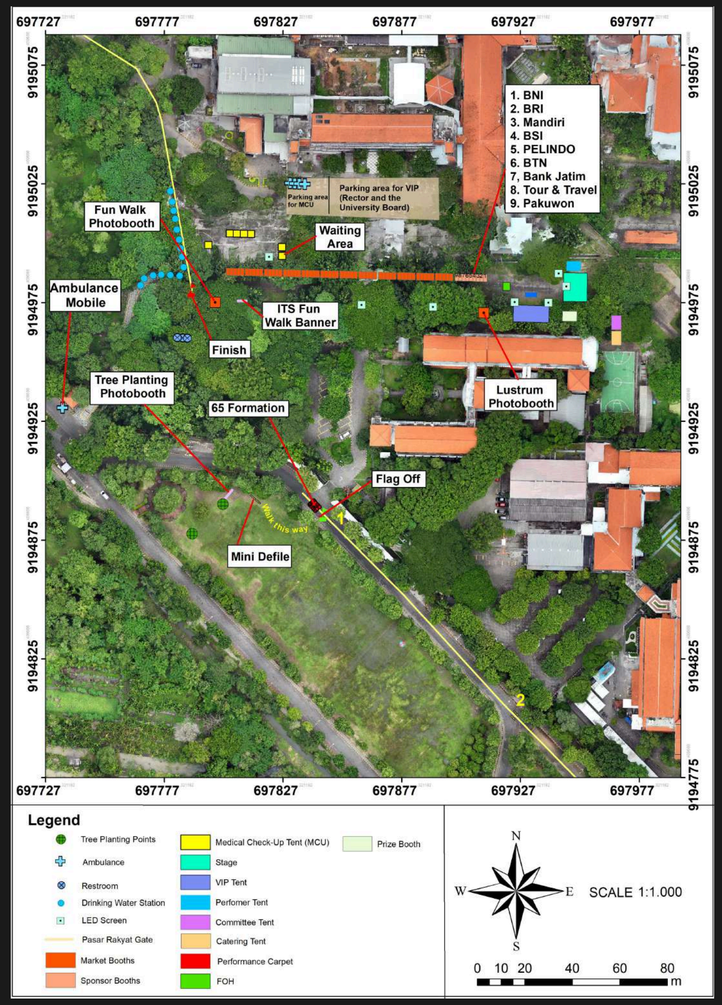
Project

Project 1

Designing Spatial Experiences for the 65th ITS Anniversary

Venue Layout for the 65th ITS Anniversary (Dies Natalis)

This venue layout for the 65th ITS Anniversary (Dies Natalis) was developed through a month-long process involving multiple revisions, coordination meetings with committees and university leaders, and on-site field surveys. The design required strategic spatial planning and adjustments to optimize the placement of event zones, circulation paths, and audience flow. By combining spatial analysis, design refinement, and real-site validation, I produced a functional and visually balanced layout that accurately reflected on-ground conditions and contributed to the event's overall success.



Work Duration :

30 Days

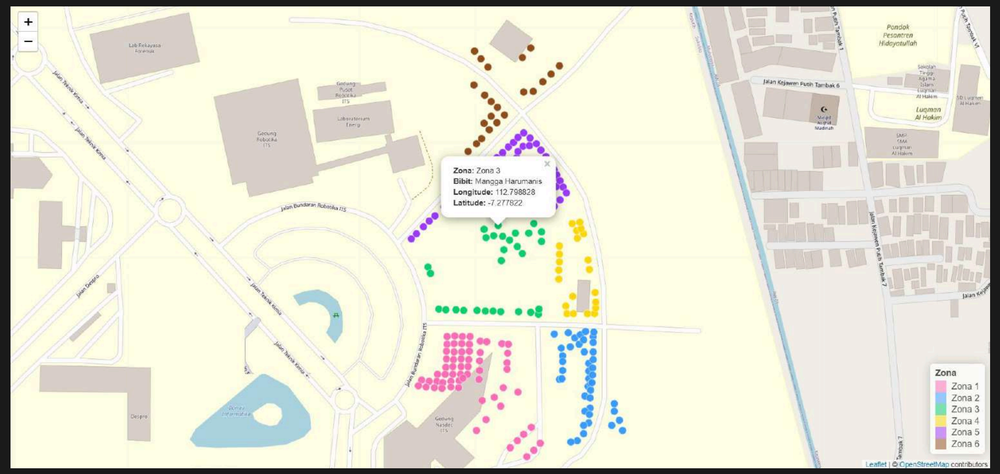
Software & Tools Used :

Project 2

GUGUR GUNUNG 8.0 : Toward ITS Net Zero Emissions
Tree Planting and Mass Clean Up

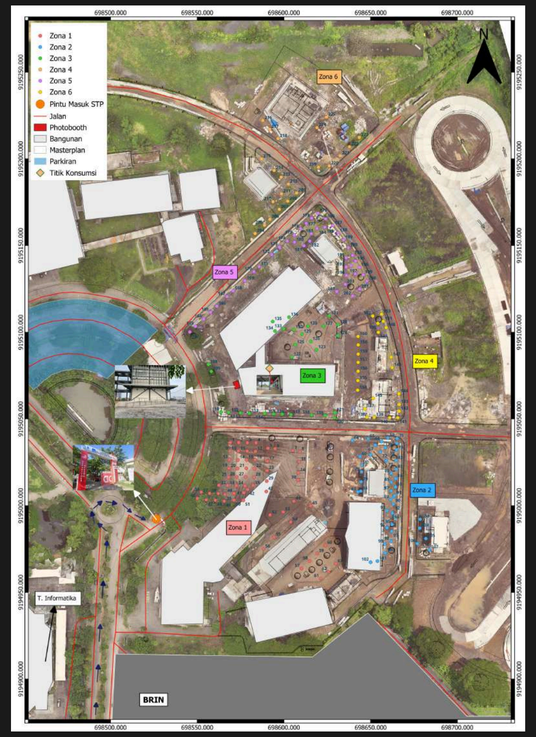
ITS Tree Planting Map

This interactive map visualizes tree-planting points surveyed using geodetic GPS across six planting zones within the ITS STP area. Developed with R Studio and Leaflet, it enables users to view each tree's Zone, Coordinates, and Tree ID. The map is also used by the tree-numbering and barcode-installation team to easily locate trees in the field, making their work faster and more accurate.

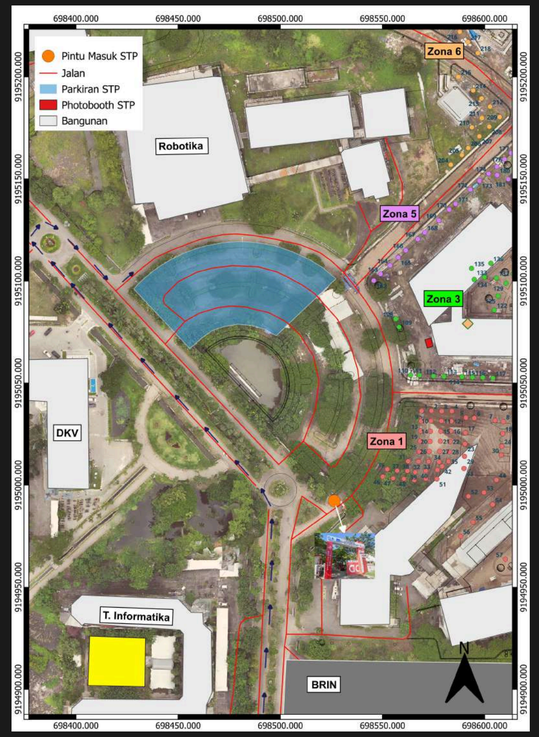


View Interactive Map :
https://retnowatisriwardani.github.io/ITS-Green-Movement/

Layout Event



Parking Area Layout



I also designed the event and parking layout maps, using orthophoto-based spatial planning to guide facility placement and participant movement. These maps played a key role in ensuring a smooth and well-coordinated tree-planting event at ITS.

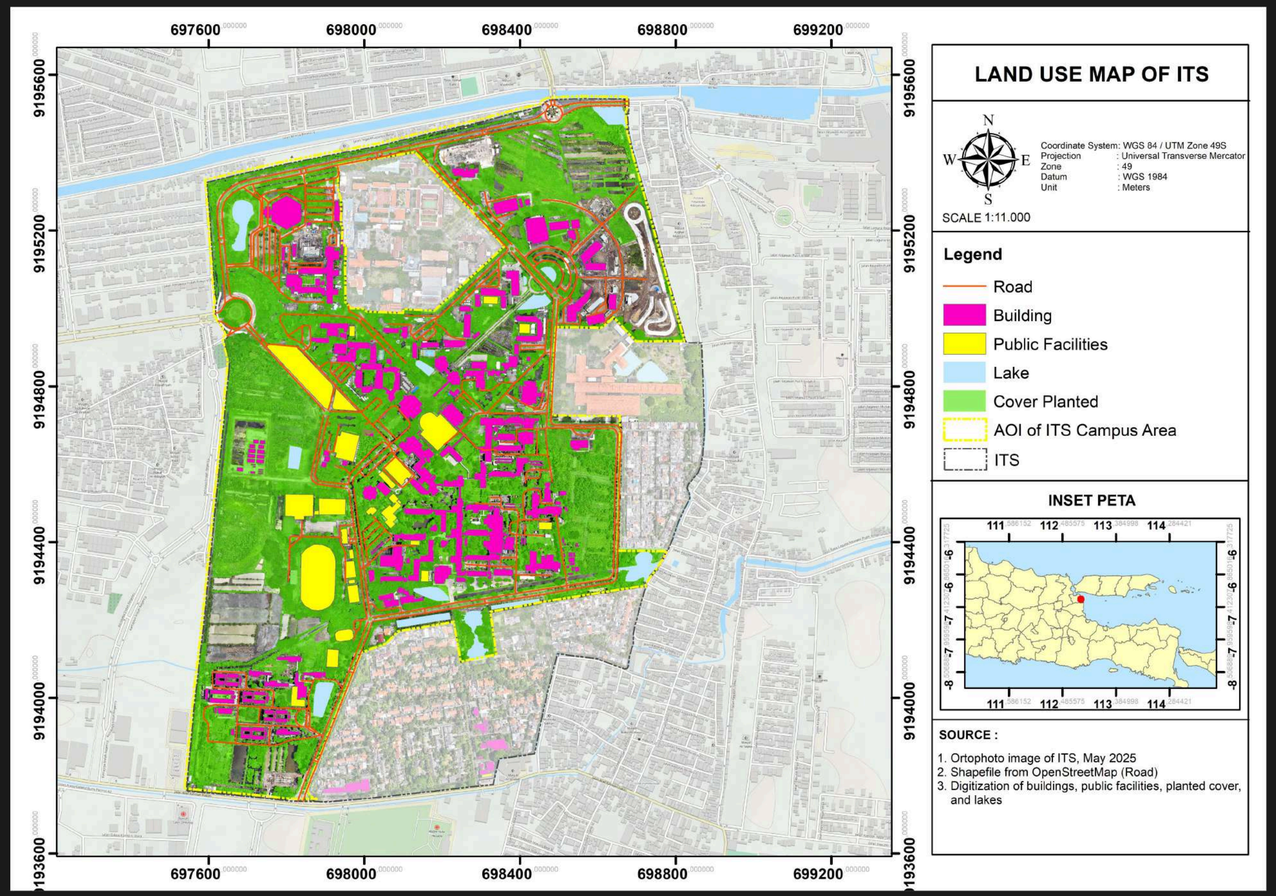
Work Duration :

3 Days

Software & Tools Used :

Project 3

Strategic Landuse Mapping of ITS Campus to Strengthen UI GreenMetric Achievements



LAND USE MAP OF ITS

This landuse map of ITS Campus was developed through a precise geospatial workflow involving digitization, dataset integration, and the Erase tool in ArcGIS to accurately map buildings, facilities, lakes, and vegetated areas. The cover planted layer was generated by merging multiple land cover datasets and erasing non-vegetated features, ensuring topological precision and visual clarity. Beyond simple mapping, this project demonstrates advanced spatial processing and cartographic expertise that support ITS's sustainability goals and UI GreenMetric performance.

Work Duration :

7 Days

Software & Tools Used :

ArcGIS

Project 4

Strategic Zoning Mapping of ITS Campus to Strengthen UI GreenMetric Achievements

ITS CAMPUS ZONE MAP

This zoning map of ITS Campus was developed based on the official ITS Masterplan, highlighting each Area of Interest (AOI) to clearly define the campus's spatial structure. Using digitized zoning boundaries and the Erase tool in ArcGIS, I designed focused visualizations where each zone stands out while the surrounding areas are softly blurred — making the layout both aesthetically clear and easy to interpret. More than just zoning, this project combines cartographic precision and spatial design expertise to support sustainable campus planning and strengthen ITS's performance in the UI GreenMetric global ranking.

Work Duration :

7 Days

Software & Tools Used :

ArcGIS

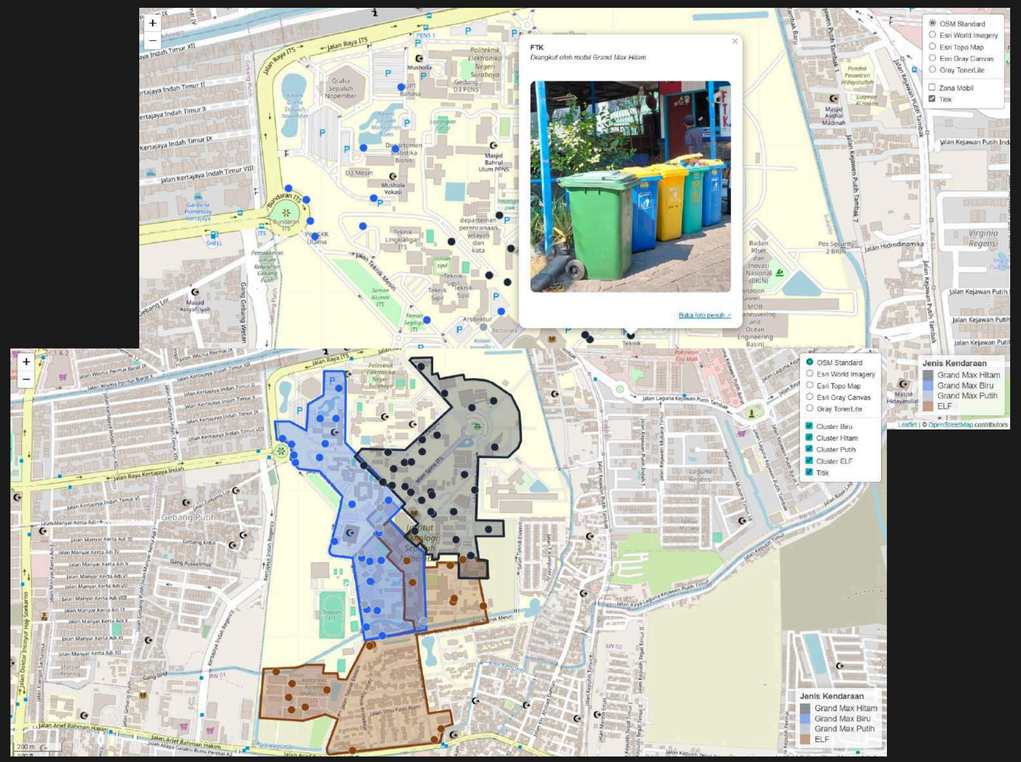
Project 5

Empowering Campus Sustainability Through Interactive Waste Mapping

INTERACTIVE WASTE COLLECTION MAP

This interactive map visualizes waste collection points across ITS Campus, featuring each trash site with its photo, coordinates, and assigned collection vehicle. Field data were collected using Avenza Maps, where I manually recorded the coordinates of every waste site during on-site surveys. The spatial data were then processed and visualized in R Studio, integrating photo datasets hosted on GitHub to create interactive pop-ups for each location.

The final map was published publicly via GitHub, enabling open access for campus stakeholders to monitor and optimize waste collection operations. This project reflects my ability to combine field data acquisition, GIS processing, and web-based mapping to support smart and sustainable waste management at ITS.



View Interactive Map :
https://retnowatisriwardani.github.io/ITS-WasteMap/

Work Duration :

5 Days

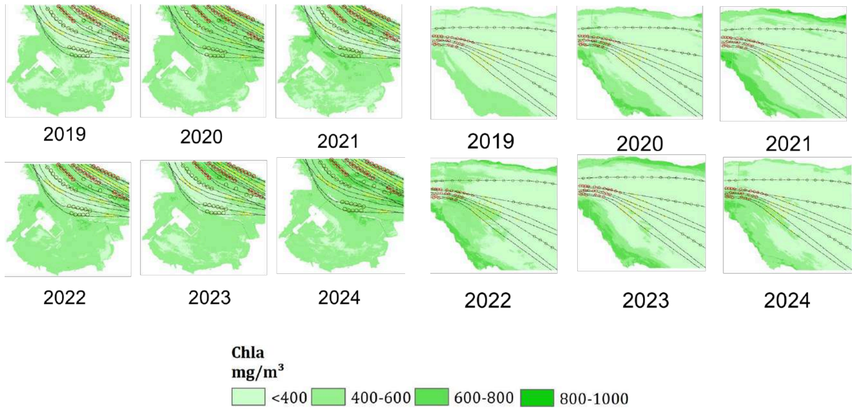
Software & Tools Used :

Academic Research

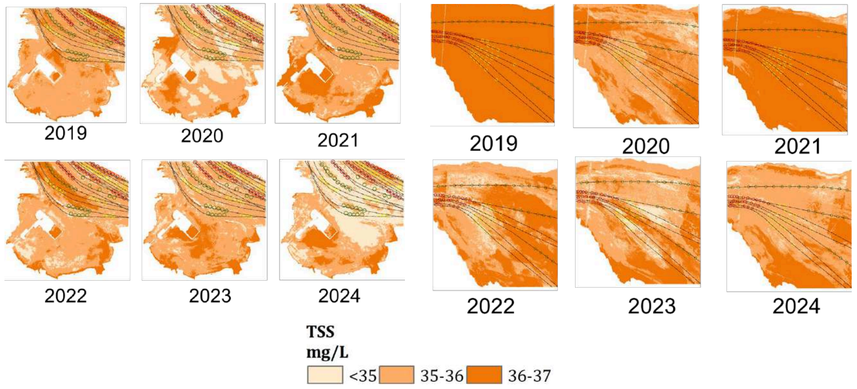
Master Thesis

Analysis of The Distribution of Chlorophyll-A, Dsissolved Oxygen, and Total Suspended Solids (TSS) in The Madura Strait Shipping Channel 2019-2024

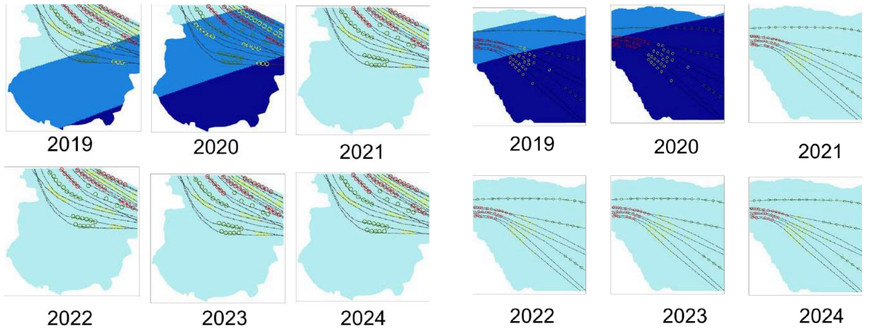
Chlorophyll-a



Total Suspended Solid



Dissolved Oxygen



The analysis compared shipping-lane densities (dense, moderate, less dense) using Pearson correlation within buffer zones around each route.

- Chlorophyll-a was estimated using algorithms from prior studies in nearby marine areas.
- TSS was modeled with a Random Forest algorithm using hydrodynamic model inputs.
- DO data were obtained from the CMEMS Global Ocean Biogeochemistry product.

Stronger effects of shipping on water quality variability were seen in the shallow, dense lanes - especially for Chl-a, TSS and DO. Deeper areas show more complex and inconsistent patterns.

This project shows my strength in using GIS to turn satellite and oceanographic data into insightful, decision-ready environmental intelligence, revealing how shipping-lane intensity shapes water-quality dynamics over space and time.

Work Duration :

6 Months

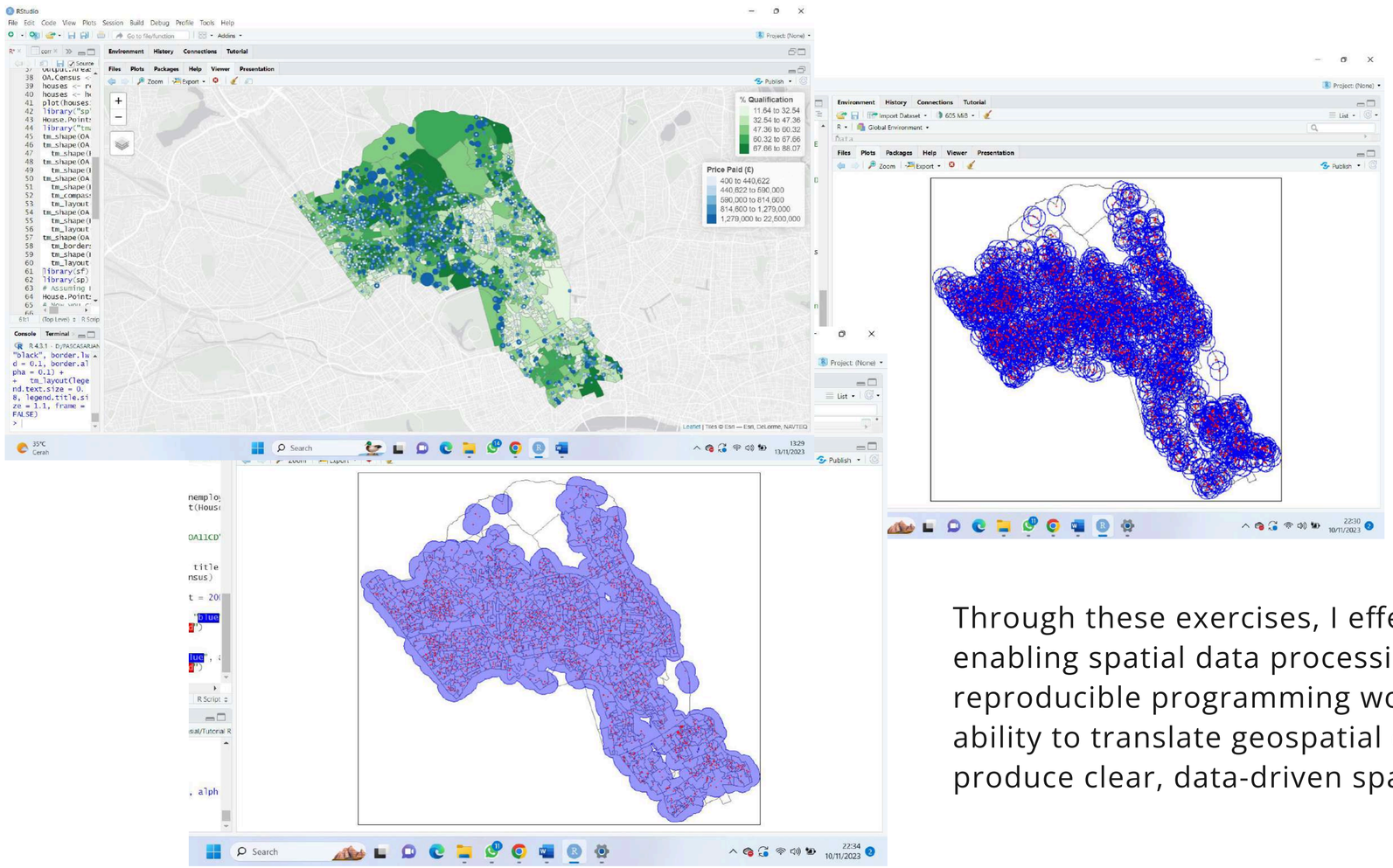
Software & Tools Used :

SNAP CO ArcGIS

Other Projects / Assignments

Assignment 1

Applied GIS Programming and Spatial Analysis in R



I built solid GIS capabilities in R by performing key spatial operations such as point-in-polygon analysis, buffering, union, spatial joins, and attribute integration. I also produced various spatial outputs—including bubble maps, choropleth maps, point maps, and interactive web maps—using sf, sp, tmap, and Leaflet.

Through these exercises, I effectively used R as a full GIS environment, enabling spatial data processing, visualization, and analysis within a reproducible programming workflow. This experience strengthened my ability to translate geospatial questions into analytical solutions and produce clear, data-driven spatial outputs.

Work Duration :

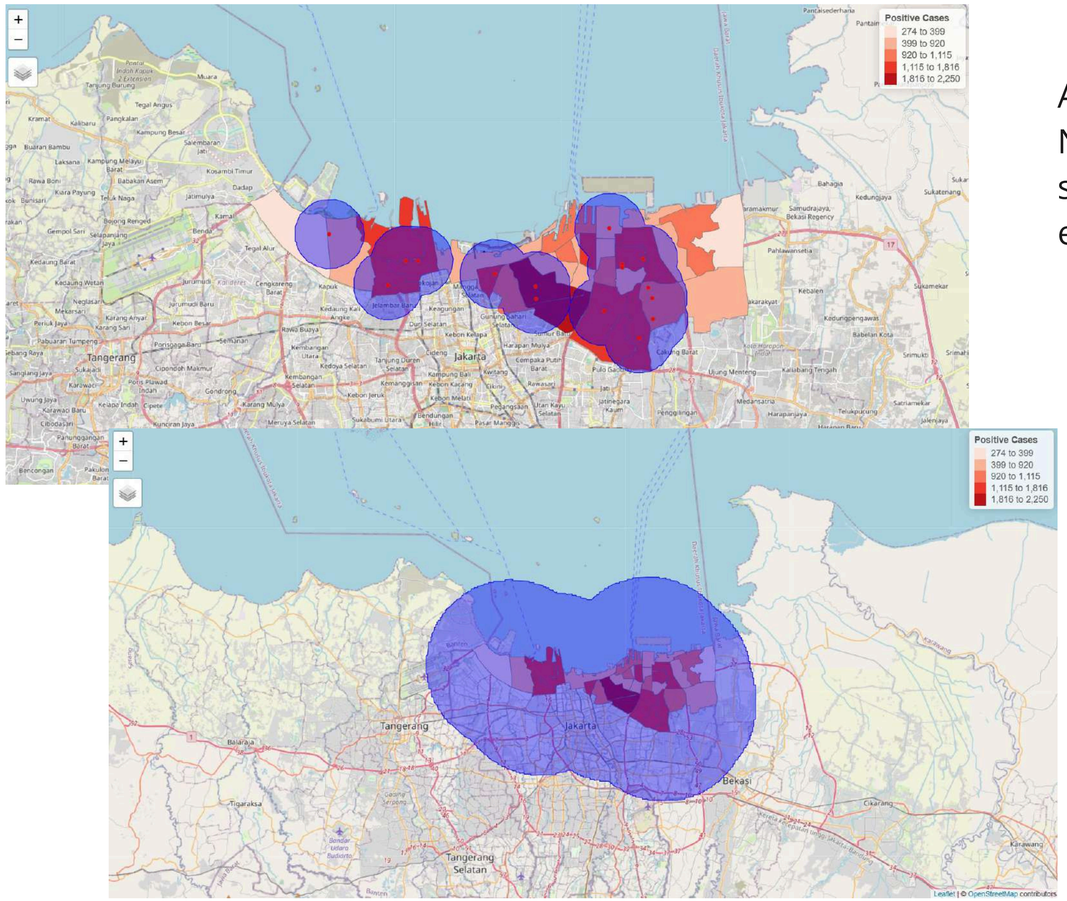
2 Weeks

Software & Tools Used :

RStudio

Assignment 2

Spatial Analysis of COVID-19 Distribution & Public Facilities Mapping — North Jakarta



As part of my GIS coursework, I analyzed referral-hospital accessibility in North Jakarta using 3 km and 10 km multi-buffer modeling. The 3 km buffer showed uneven near-access coverage, while the 10 km buffer covered the entire city, reflecting city-wide reach but unequal proximity for residents.

When overlaid with COVID-19 case data, several districts within the 3 km buffer still reported high infection rates, indicating that urban density and social interaction play a stronger role than proximity alone.

This assignment highlights my ability to apply GIS geoprocessing for health-service accessibility assessment and spatial risk interpretation based on real-world datasets.

Work Duration :

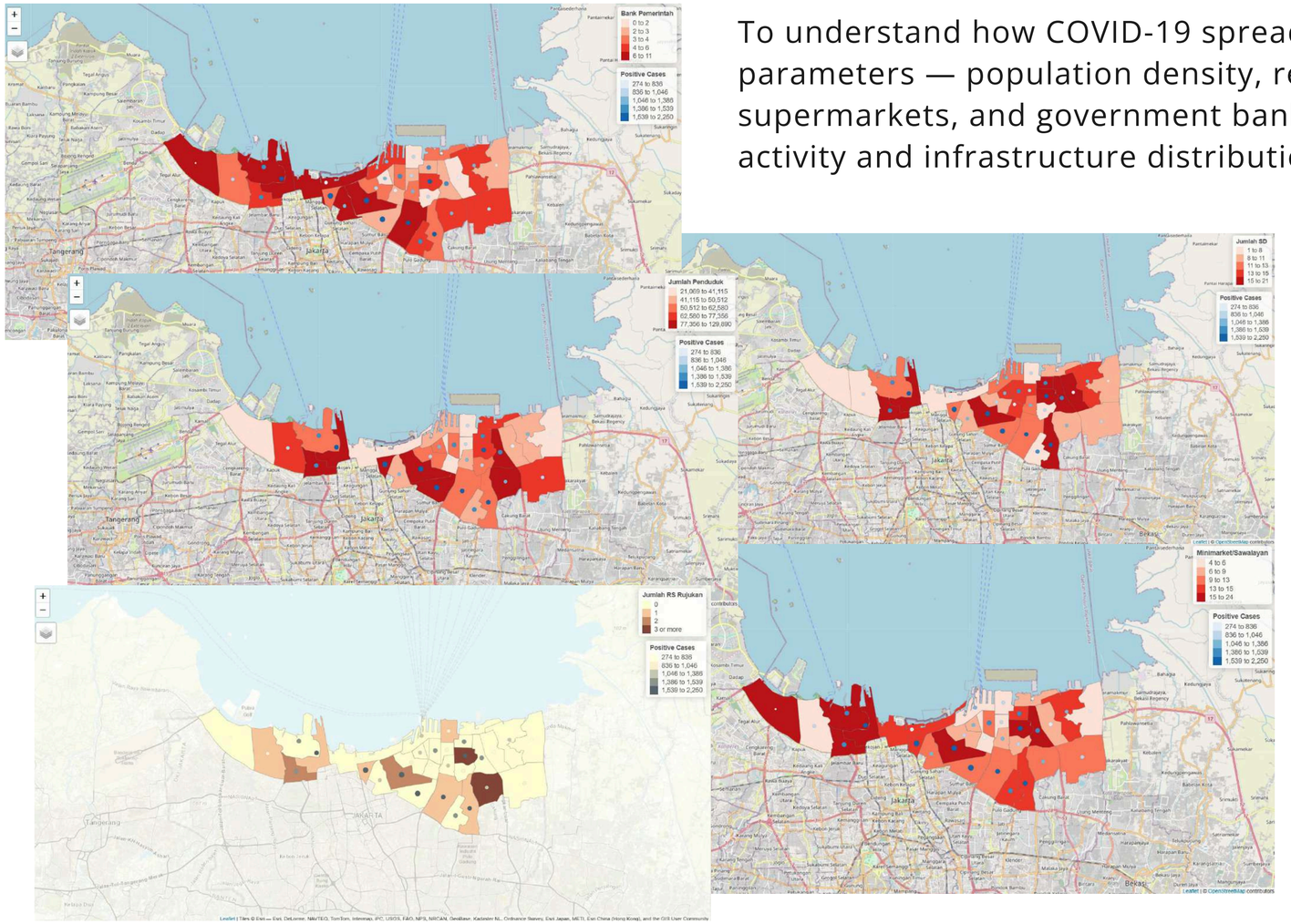
3 days

Software & Tools Used :

RStudio

Assignment 2

Spatial Analysis of COVID-19 Distribution & Public Facilities Mapping — North Jakarta



To understand how COVID-19 spread across North Jakarta, I mapped key socio-spatial parameters — population density, referral hospitals, elementary schools, minimarkets/ supermarkets, and government banks — as separate thematic layers to visualize community activity and infrastructure distribution across districts.

Each layer was then overlaid with COVID-19 case intensity, allowing hotspots to be compared with the social and physical characteristics of their surrounding environments. This approach revealed spatial patterns that were not visible from case numbers alone.

The results showed that districts with higher interaction intensity recorded the highest COVID-19 cases, driven by dense populations and active social-economic facilities. This demonstrates my ability to use GIS to link multi-layer spatial data and generate actionable public-health insights.

Work Duration :

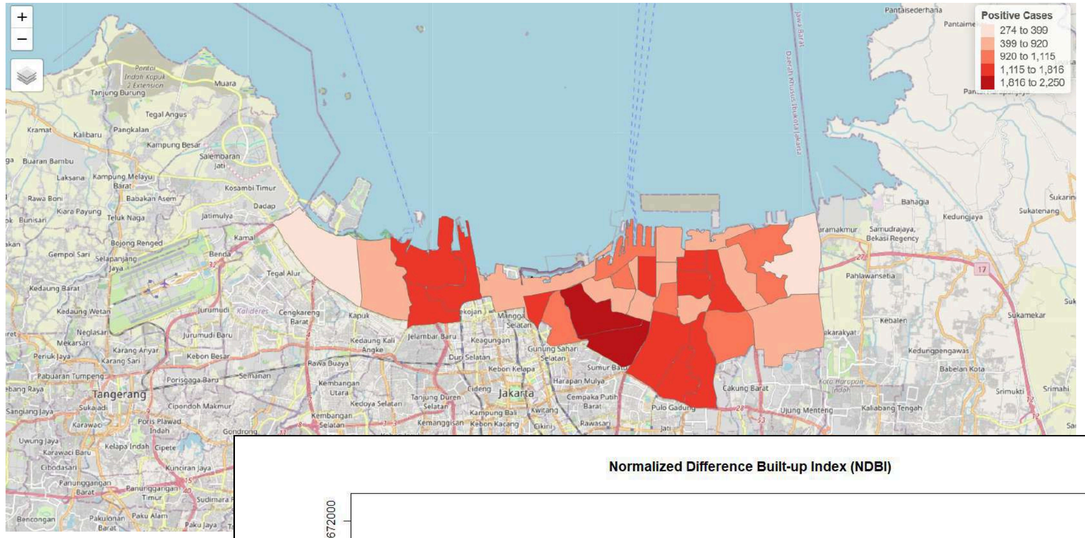
1 Weeks

Software & Tools Used :

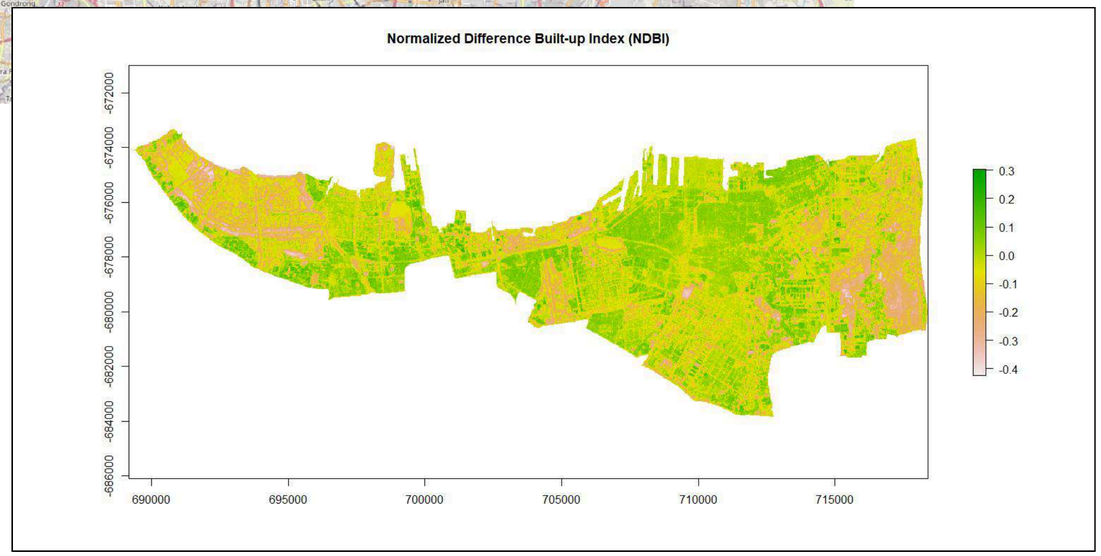
RStudio

Assignment 2

Spatial Analysis of COVID-19 Distribution & Public Facilities Mapping — North Jakarta



To push the spatial analysis further, I brought in satellite-derived Built-Up Index (NDBI) — turning raw remote-sensing data into real epidemiological insight. The result was striking: areas with the highest built-up intensity weren't just "urban," they were COVID-19 epicenters. Dense housing blocks, narrow living spaces, and tightly packed neighborhoods created the perfect storm for transmission.



This wasn't just mapping — it was evidence. By linking NDBI with case hotspots, I showed how urban form directly amplifies public-health risk, even before human mobility and behavior are measured.

In short, I leveraged remote sensing + GIS analytics to connect the physical shape of a city with the real-world spread of a pandemic — proving that spatial data can tell powerful stories and drive smarter decision-making.

Work Duration :

1 Weeks

Software & Tools Used :

RStudio