Harnessing Earth Observations and Data Science to Evaluate Socio-Environmental Issues

Basic Information

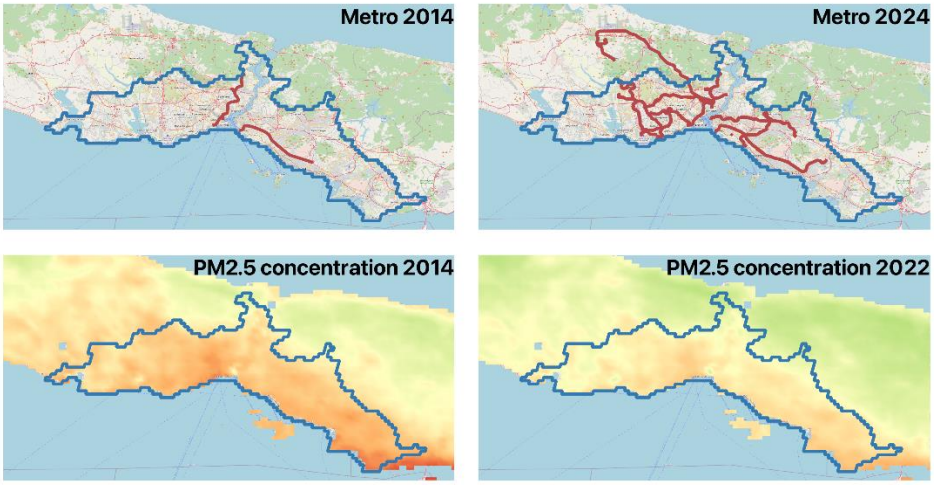
- Level: Introductory.
- Prerequisite for participants: None! Just bring your curiosity.
- Technical support: Python code and preparatory materials will be disseminated before the training. Participants need to bring laptops.

Purpose, content, and anticipated outcomes

Lack of reliable and consistent data is often named as a critical obstacle for impact evaluation. Yet, modern world generates an abundance of unconventional data, which could be used for evaluators' needs. Geospatial data is just one example. Collected via various means – from satellite observations to crowdsourcing – this type of data enables timely, objective, and location-specific insights at a reasonable cost.

This workshop aims to provide practical introduction into the use of geospatial data in evaluation. We will discuss when and how evaluators could benefit from using this new tool with a particular focus on development interventions. At this interactive and hands-on workshop, we will take you step-by-step through the entire process—from gathering data, to analysing it, all the way to visualising results. As a working example throughout the sessions, we will look at the quality of urban environment, including pressing topics like air pollution, transport, and economic activity. Figure below shows a simple example of geospatial data utilisation to address these questions.

Figure – Recent developments in metro and air quality in Istanbul urban area (blue zone)



Source: OpenStreetMap, Shen et al (2024)

This workshop intends to have both short- and long-term outcomes. In the short run, you will:

- Receive introduction into geospatial analytics and learn about various types of geospatial data.
- Understand methods of utilising geospatial data in evaluations at various stages of intervention.
- Gain hands-on experience of using popular tools such as Python and Google Earth Engine to access, analyse, and visualize geospatial data.

In the long run, we believe this workshop will open up thinking to analyse environmental and social compliance not just in the evaluation context (or ex-post) but also in the ex-ante project preparation and evaluability assessment stages, and ultimately shape the way large-scale development interventions can be designed, targeted, shaped and evaluated over time.

Delivery Method

No technical experience needed! This workshop is all about learning by doing. The facilitators will take multiple actions to ensure dynamic and interactive nature of the workshop:

- **Get Ready to Dive In:** A couple weeks before the event, we will send out some free optional tutorials to get you warmed up with geospatial data in Python.
- **Hands-On Experience:** During the workshop, you will be working with a Google Colab notebook that is ready to go. We will walk you through the most interesting parts of the code step by step. A complete solution will be provided as well, so you can focus on learning and experimenting without any stress.
- **Solving Your Case:** If you already have a practical case in mind that may benefit from geospatial data, you can contact us it in advance for in-class discussion.

Sample programme

The workshop consists of four main sessions:

- **Session 1: Introduction into geospatial data, processing, and analysis**. This session will start with the discussion of geospatial data types available via earth observations, modelling, and crowdsourcing and ways to process them for capturing of environmental and economic changes. It will clarify when geospatial analysis is mostly applicable to evaluations.
- **Session 2: Monitoring and benchmarking performance**. We will follow up to show how geospatial data could be deployed before and during an intervention to assess its relevance, monitor its progress, and capture early results. As an example, we will leverage publicly available sources like Google Earth Engine and demonstrate Python code to extract and process data from these sources.
- **Session 3: Attributing observed change to intervention**. Next, we will harness the power of geospatial data and methods of data science to capture long-term changes and attribute these changes to an intervention as part of impact evaluation.
- **Session 4: Communicating the results**. This final session will present the results obtained before in an intuitive and appealing way, targeting a non-technical audience and suggesting ways for evaluators to communicate their findings better. We will show you how to create interactive maps, turning your data into a visual story that is as compelling as it is informative.