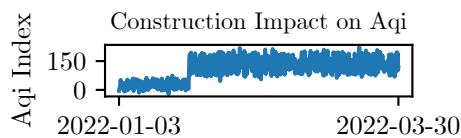
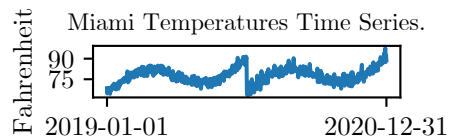


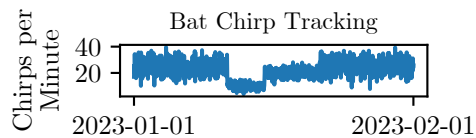
Consider a scenario measuring the water level in a reservoir. The water level depends on various factors such as rainfall, temperature and evaporation rates. An extreme weather event such as heavy rain or drought can cause significant shifts in the observations. The data is sampled every hour over a period of 40 days, giving 960 observations.



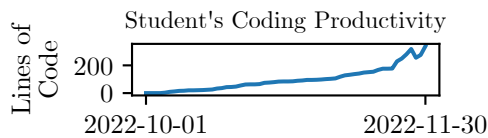
The time series records hourly air quality index (AQI) for a busy intersection in a city over a period of one month. A major construction project nearby significantly increases AQI levels after the first week. The sample rate is every hour.



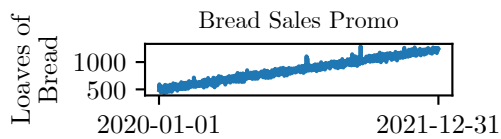
The time series presents the daily average temperature (in Fahrenheit) in Miami over a period of two years (approximately 730 observations). The city's subtropical climate suggests a cyclical pattern, with summer highs and winter lows. External event: an El Niño phase might increase the temperature abnormally during winter. The sample rate is 1 per day.



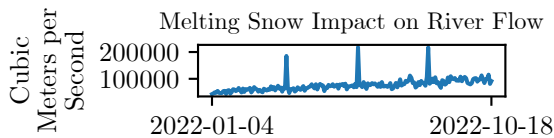
A wildlife conservation group monitors a certain bat species with a sonic detector in a woodland area. Bat chirp instances get detected by the device and recorded over time. A nearby outdoor music event might cause a drop in frequency as the bats get disturbed. The detector records chirps every minute over a month-long period.



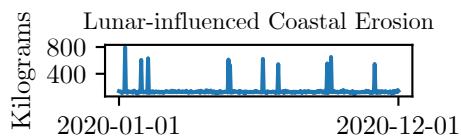
A computer science student is undertaking a personal project to prototype an AI model. The time series will represent his productivity level, measured by the number lines of code written every day. However, during a four-day Computer Science conference attended by the student, we should expect a temporary significant decrease in productivity. The time series will be sampled over a two month period at a daily rate (60 observations in total).



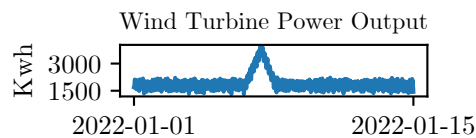
A supermarket chain is tracking the daily sales of a popular brand of bread for a period of two years. The external event is a promo period where bread has a 30% discount for a week. This might increase sales numbers drastically during the promo period. The sample rate is once per day, and the total duration is two years.



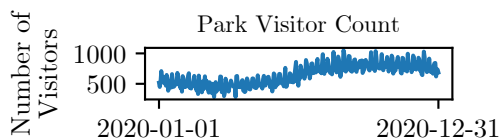
The scenario involves tracking the river water flow in a mountainous region from early spring to late summer. The time series would sample river flow rate once per day for 200 consecutive days. The violent snow melting due to warmer temperatures (external event) could largely influence the river's water flow rate, causing it to surge dramatically.



A geologist is studying the effects of lunar cycles on coastal erosion rates over a one year period. Using equipment to measure the amount of sediment displaced each day (in kilograms), the geologist records daily readings from a coastal location. This produces a time series of erosion rates, which may be influenced by the external event of changing lunar cycles. The sample rate of this time series is daily, and the duration is one year.



A sustainable energy company has deployed a wind turbine in a coastal area. The power output of the wind turbine is recorded every 15 minutes for two weeks. During this period, a significant storm event occurs, causing the wind speed to drastically increase, thus affecting the power output of the turbine.



We are observing the visitor count at a National Park over a period of a year at a daily rate. A major environmental clean-up initiative (external event) halfway through might increase the visitor count due to better park conditions.