Main concerns of urban areas include the lack of green spaces, trapping of concentrated air contaminants, interrupted water cycle and impacted runoff water from roadways, industrial soil contamination and disrupted natural soil infiltration due to urbanization. The following is selected thematic areas within the urban environment matched with the respective GLOBE study areas and protocols.

**MORNING AND AFTERNOON** **BREAKOUT**

**MORNING BREAKOUT** **ONLY**

**AFTERNOON BREAKOUT ONLY**

|  |  |  |
| --- | --- | --- |
|  **Thematic Area** | **GLOBE Sphere** | **GLOBE Protocols** |
| **Atmosphere Quality** | Atmosphere Protocols | Air Temperature, Relative Humidity, Precipitation, Surface Temperature, Clouds (*Observer App*), Aerosols, Pressure |
| **Urban Layout/ Expansion** | Biosphere ProtocolsHydrosphere Protocol | Land Classification (*Observer App*), Tree Height (*Observer App*)Mosquito Habitat Mapper (*Observer App*) |
| **Impacted Hydrology** | Atmosphere ProtocolsHydrosphere ProtocolsBiosphere ProtocolsPedosphere Protocols | Precipitation, Air Temperature, Surface TemperatureTransparency, Water temperature, D.O., Nitrates, pH, Alkalinity, E.C.Land Classification (*Observer App*), Biometry, Carbon CycleSoil Infiltration, Soil Moisture |
| **Impacted Soil** | Pedosphere Protocols | Soil Characterization, Soil Infiltration, Soil Moisture, Soil Temperature, N, P, K |
| **Urban Heat Island** | Biosphere ProtocolsAtmosphere ProtocolsPedosphere ProtocolsHydrosphere Protocols | Land Classification (*Observer App*), Biometry Surface Temperature and Air Temperature, Clouds (*Observer App*)Soil Temperature, Soil MoistureWater Temperature, Water Transparency |
| **Greenery in the City** | Biosphere ProtocolsAtmosphere Protocols | Land Classification (*Observer App*), Biometry, Green Up/Down, Tree Height (*Observer App*)Air Temperature and Surface Temperature |