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 Protocols  Hydrosphere Protocol | Land Classification (*Observer App*), Tree Height (*Observer App*)  Mosquito Habitat Mapper (*Observer App*) |
| **Impacted Hydrology** | Atmosphere Protocols  Hydrosphere Protocols  Biosphere Protocols  Pedosphere Protocols | Precipitation, Air Temperature, Surface Temperature  Transparency, Water temperature, D.O., Nitrates, pH, Alkalinity, E.C.  Land Classification (*Observer App*), Biometry, Carbon Cycle  Soil Infiltration, Soil Moisture |
| **Impacted Soil** | Pedosphere Protocols | Soil Characterization, Soil Infiltration, Soil Moisture, Soil Temperature, N, P, K |
| **Urban Heat Island** | Biosphere Protocols  Atmosphere Protocols  Pedosphere Protocols  Hydrosphere Protocols | Land Classification (*Observer App*), Biometry  Surface Temperature and Air Temperature, Clouds (*Observer App*)  Soil Temperature, Soil Moisture  Water Temperature, Water Transparency |
| **Greenery in the City** | Biosphere Protocols  Atmosphere Protocols | Land Classification (*Observer App*), Biometry, Green Up/Down, Tree Height (*Observer App*)  Air Temperature and Surface Temperature |