Chapter 11: Google Earth Exercise

Exercise 1
Settlement Patterns: Ontario's Greenbelt as a Case Study

The process of urban sprawl has characterized the Greater Toronto Area since the construction of the first suburbs in the 1950s. Efforts to curtail the conversion of agricultural land to suburban development have resulted in the formation of the "Greenbelt"—a swath of forested, agricultural, and rural land protected from development that encircles the metropolitan region. The greenbelt follows the natural features of the landscape including the sensitive ecosystems atop the Niagara escarpment (light green and orange) the head waters of the Oak Ridges moraine (dark green). The goal is to intensify development in areas enclosed by this protected zone and Lake Ontario. Market forces and the demand for lower-cost housing however, have now pushed development beyond this zone into areas defined as "exurban."

The task: Using Google Earth and street view, visit a collection of points along a line that traverses the city, the suburbs and the areas beyond. Describe densities and the typical development form, as well as the type of land use.

Step 1: Ensure that the "borders and labels" layers are enabled. Load the Chapter 11.kmz file.

Step 2: Enable the "3D buildings" layer. Begin by examining the density of several locations within the metropolitan area of Toronto. Double click the "Downtown Toronto" marker. You can click on the 3D buildings to determine their function. Open the "Density Transect" folder and double click on the "Financial District" marker.

➢ **Question 1:** How would you describe the density of this area (e.g., low, moderate, or high)? What types of businesses are represented here and what region do they serve?

Step 3: Continue to the other "Density Transect" locations, noting how far you are from the downtown core of the city and using street view to examine the built environment.

➢ **Question 2:** Classify the placemarkers as urban, suburban, rural, or exurban and comment on their density.

Step 4: Double click on the "From Grain Production to Market Gardening" tour.

➢ **Question 3:** What is the strip of land unclassified by the greenbelt layer bordered by Milton to the east and Guelph to the West? (Hint: search for Geographic Features) Based on your observation what has the effect of the greenbelt been on the location of recent exurban development?

Exercise 2
Urbanization at a Global Scale

Toward the end of the last decade, the number of people living in urban settlements exceeded the number living in rural areas for the first time in human history. Urbanization—or the proportional growth of a population living in urban areas—has been extraordinarily rapid and relatively recent. In the 1800s, only three percent of the worlds, population lived in urban centres. UN estimates indicate that two-thirds of us will be urban dwellers by 2050. However, as we will see in the exercise below, the spatial distribution and relative size of urban centres reveals some important differences in how the pace and scale of urbanization proceeds across the globe.

The task: Using Google Earth, examine the growth and spatial distribution of large and mega cities (cities with more than 10 million inhabitants) worldwide using a dataset derived from the UN and complied by Nordpil. The data cover historical observations as well as projections for urbanization up to 2050. The population of each urban centre is represented by a bar—the higher the elevation of the bar, the larger the urban centre. Clicking on each bar will generate a window with population data and projected estimates for each city.

Step 1: Ensure that the **borders and labels** layers are enabled. Load the Chapter 11.2.kmz file.

Step 2: Set the timeline window bar (figure 1) to the year 1947.
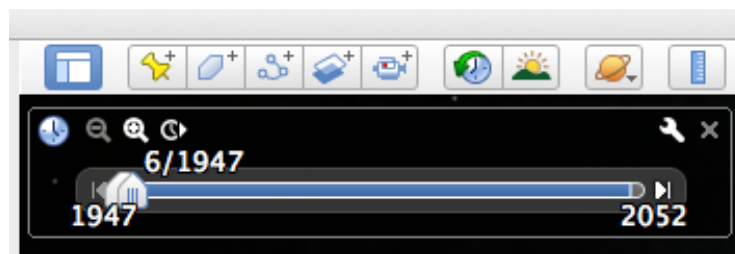

Figure 1: timeline bar

➢ **Question 1:** Pan around the globe and observe the spatial distribution and relative size of cities worldwide. Where are the three largest cities in the world located? What are their population sizes in 1950? (Reminder: clicking on a bar will generate the actual population data for the city).

Step 3: Play the timeline to watch the growth of urban centre between 1950–2050, observing rate and concentrations of urban growth across the globe.

➢ **Question 2:** In the year 2050, which country is projected to have at least three urban centres with populations exceeding 20 million?
➢ **Question 3:** Which country shows the greatest spatial concentration of urban centres?
➢ **Question 4:** What city is projected to be the largest in North America?

Step 4: Search for Shenzhen, China in the search bar.

➢ **Question 5:** By how much did the city grow between 1985 and 2005?

Answers

Exercise 1

➢ **Question 1:** This area represents the highest density within the Toronto metropolitan region. Land values here are very high and the typical functions present are financial services and business headquarters. High value residential development is also present, in particular along the lakeshore. Many of the functions in this area serve the entire country, rather than the surrounding region.

➢ **Question 2:**

Placemarker	Classification	Density
Financial District	Urban	Very High Density
Kensington Market	Urban	Moderate Density
Palmerston Avenue	Suburban	Low-Moderate Density
Bimini Crescent	Suburban	Low Density
Concession Road 10	Rural	Very Low
Campi Road	Suburban	Low
Bennett Road	Exurban	Low
South Guelph	Exurban	Very Low
Bradford	Exurban	Very Low

➢ **Question 3:** The strip of land is the Niagara Escarpment, a protected zone and a UNESCO world heritage site. The protection of this and other landforms in the area and the attempt to curtail urban incursion into agricultural areas has inadvertently promoted development outside the greenbelt in exurban regions like Guelph and Bradford.

Exercise 2

➢ **Question 1:** Tokyo, Japan: 11.28 million; London, England 8.36 million; New York, USA 12.34 million.
➢ **Question 2:** India. The three urban centres with populations expected to surpass the 20 million mark include Mumbai (26.385 million), Delhi (22.498 million), and Kolkata (20.56 million) in India.
➢ **Question 3:** China. The Pearl River Delta, which includes cities like Shenzhen and Guangzhou is currently the largest urban agglomeration in the world, home to more than 42 million people.
➢ **Question 4:** Ciudad de México (Mexico City, population 21.009)
➢ **Question 5:** In that 20-year period the city grew from 500,000 to 7.23 million.