Question 1

What is the total area of land that would be affected by 1m, 2m and 3m of sea level rise?

The total area of land that would be affected by 1m is $5.17754e+07 \text{ m}^2$ The total area of land that would be affected by 2m is $1.15391e+08 \text{ m}^2$ The total area of land that would be affected by 3m is $1.97337e+08 \text{ m}^2$

Question 2

Based on your analysis, which three municipalities within the Metro Vancouver region are most at risk from sea-level rise (in terms of land area)? [6 points]

The three municipalities that are most at risk from sea-level rise are Richmond, Delta and Surrey. By selecting the 1M_FloodExtent, areas in these three municipalities are highly filled with the colour of the layer - 1M_FloodExtent. By repeating the steps for 2M_FloodExtent and 3M_FloodExtent, there are similar answers. Therefore, I can conclude that these areas will be most at risk from sea-level rise.



At 3M_FloodExtent



Question 3

What is the total length of the highways (road type 1) and side streets (road type 5) that would be affected by 1m, 2m and 3m of sea level rise? Provide a 2 x 3 table, with columns for road type and rows for sea-level rise. [6 points]

| Sea Level Rise (Flood Extent) | Road type 1 | Road type 5 |
|-------------------------------|-------------|-------------|
| 1m | 39022.2 | 267238 |
| 2m | 61586.7 | 498781 |
| 3m | 68586.6 | 786641 |

Question 4

What schools and hospitals, if any, would be affected by 1m, 2m or 3m of sea-level rise? Similar to Question 2, provide the answers in a 2 x 3 table [6 points]

| Sea Level Rise | Schools | Hospitals |
|----------------|--|----------------------|
| 1m | 1 or 0 *PRP FOR AUTISM AND RELATED DISORDERS | 0 |
| 2m | 2 (i) ALFRED B DIXON ELEMENTARY (ii) MEADOWLAND ELEMENTARY | 0 |
| 3m | 6 (i) ALFRED B DIXON ELEMENTARY (ii) DOGWOOD SCHOOL (iii) MEADOWLAND ELEMENTARY (iv) MITCHELL ELEMENTARY (v) ST JOSEPH THE WORKER (vi) STATION STRETCH | 1 PINEGROVE PLACE |

*The PRP FOR AUTISM AND RELATED DISORDERS is shown on the attribute table at 1M flood extent. However, it is not shown neither on the 2M nor 3M flood extent intersected layer.

Question 5

St. Paul's Hospital, currently located on Burrard St. in downtown Vancouver, will be moving to the False Creek flats, adjacent to Pacific Central Station.

Based on your maps, do you think this new location under threat with either 1m, 2m, or 3m of sea level rise? What about the access to the new location (road network in the area, etc.)? [4 points]

No, it is because, based on the map, either 1 m, 2 m or 3 m of sea-level rise still cannot reach the exact new location of St.Paul's hospital. Therefore, whenever there is 1 m, 2 m or 3 m sea-level rise, St.paul's hospital will not be under threat. The access to the new location will not be affected by the sea-level rise as well. It is because, on the map, 1 m, 2 m and 3 m sea-level rise cannot reach the roads nearby the new location, thus when there is 3 m sea-level rise, there is still accessible transportation to the new location.



** circled area is the approximate new location of the St. Paul's hospital as it is beside the Pacific Central station



Question 6

Pick a neighbourhood or small area of Metro Vancouver that, based on your maps, is vulnerable to an increase in sea-level rise. The area should be small, less than 2 km in diameter; an example might be Jericho Beach.

Based on your maps and independent research, what type of activities and land use are in the area (i.e., key infrastructure, economic activity, environment, cultural amenities)? What further geographic information would you want to conduct a full risk assessment for this area? Answer can be in a paragraph, 6-8 sentences. [7 points]

The science world is vulnerable to an increase in sea-level rise. According to the map, the science world is vulnerable to 1m, 2m and 3m of sea-level rise. There are different types of land use such as commercial or recreation, open space and protected natural areas or undeveloped areas will be affected by the 1m, 2m or 3m flood extent (as shown on the maps below). Based on my independent research, there are cultural amenities in that area. Beside the science world, there is a Creek Side Park and also a OMNIMAX Theatre at Telus World of Science. These areas are highly affected by the sea level rise. For further geographic information, I would like to know more about the transportation network, elevation level, buildings, population and past flooding records of that area. In this way, the government can build a better transportation network so that people can leave the place right away when flooding occurs. By knowing the elevation levels of different places in that particular region, I can know where are the nearest locations that have the highest elevation levels from the science world and residential buildings, in case there is 3 m sea-level rise that may cause flooding, the residents and people within that region can move to the places with high elevation levels to ensure that they can stay in a safer place.

Science world and nearby areas:

- 🗸 📃 Commercial 🖌 📕 Undeveloped and Unclassified
- ✓ Recreation, Open Space and Protected Natural Areas



Science world with 1 m sea-level rise:



Science world with 2 m sea-level rise:



Science world with 3 m sea-level rise:

